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CONTENTS

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ORIGINAL ARTICLES

Surgical Relief of Congenital Cyanotic Heart-disease
T. HOLMES SELLORS, F.R.C.S.
J. R. BELCHER, F.R.C.S. 887

Pulmonary Hypertension in Mitral Stenosis
R. I. S. BAYLISS, M.R.C.P.
M. J. ETHERIDGE, M.R.A.C.P.
A. L. HYMAN, M.D. 889

17-Ketosteroid Excretion in the Diagnosis of Endocrine Dysfunction
W. R. BUTT, B.SC.
A. S. MASON, M.R.C.P.
C. J. O. R. MORRIS, PH.D. ... 894

Milkman's Syndrome in Idiopathic Steatorrhœa Complicated by Refractory Macrocytic Anæmia
ALASTAIR ANDERSON, M.R.C.P. 897

Primary Streptomycin-resistant Tuberculosis in a Newborn Child
J. E. TINNE, M.B.
J. L. HENDERSON, F.R.C.P.E. 901

Thrombotic "Hydrocephalus" in Insulin Therapy
JOHN DONNELLY, M.B.
E. J. RADLEY-SMITH, F.R.C.S. 904

Pulmonary Fibrosis Following Granulopenia
JOHN FRIEND, M.R.C.P.
A. C. THACKRAY, M.D. 909

Prevention of Hæmolysis during Freezing and Thawing of Red Blood-cells
A. U. SMITH, M.B. 910

SPECIAL ARTICLES

Dermatological Aspects of Unemployment and Resettlement
MARK HEWITT, M.R.C.P. 921

Pink Disease 925

MEDICAL SOCIETIES

Royal Society of Medicine: Pneumonia 911

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 927

LEADING ARTICLES

HEPATITIS 915

ATHEROSCLEROSIS AND CHOLESTEROL 916

APOLOGIA OF AN ALLERGIST 917

PUBLIC-HEALTH SALARIES 918

ANNOTATIONS

Alarming Names for Hospitals ... 919
Hypoglycæmia 919
Antibiotics in Ophthalmology .. 920
A Student Tuberculosis Centre ... 920

LETTERS TO THE EDITOR

General Practice (Dr. Frank Livesey) 928
The Changing Face of Surgery (Mr. John Grieve, F.R.C.S.E.) ... 928
Salicylate as an Anticoagulant (Dr. H. W. Crowe) 929
Philosophy of Clinical Medicine (Dr. H. E. Collier) 929
Cerebral Palsy (Dr. William Dunham) 930
German Measles in Girls' Schools (Dr. J. W. Nicholas) 930
Study of Delinquency (Dr. Peter Scott) 930
Rupture of Ascending Aorta (Dr. R. Scheuer-Karpin) 931
Mass Radiography (Dr. F. D. Beddard, Dr. F. J. H. Walters) 931
Mephenesin in Psychiatric Conditions (Dr. Ellis Stungo) 931
Doormats for Operating-theatres (Dr. Bernard Kaplan) 932
Hepatic Abscess Associated with Schistosomiasis (Mr. P. K. Dixon, F.R.C.S.I.) 932
Striæ Cutis Distensæ (Dr. V. C. Medvei) 932
Changes in the Central Nervous System Due to Electrocution (Mr. H. D. Einhorn, DR. ING) .. 933
Centre for Tuberculous Students (Prof. F. R. G. Heaf, F.R.C.P., Mr. C. R. Morris, M.A., Sir Alan Rook, F.R.C.P.) 933
Registrars (Dr. John Rich) 934
Occupational Therapy (Dr. M. E. M. Herford) 934
Stethoscopes (Mr. C. J. Dickinson) 934
Typhoid Fever in a General Hospital (Dr. H. A. Dewar) ... 935
Towards Safer Milk (Mr. Hardy Naylor) 935
Trophic and Tropic (Dr. H. St. H. Vertue; Dr. H. H. Pilling) 935

REVIEWS OF BOOKS

The Diagnosis of Salmonella Types 912
Worth & Chavasse's Squint 912
Hämolyse und Hämolytische Krankheiten 912
Bone and Joint Radiology 913
Medical Entomology 913
A Pattern for Hospital Care 913
Atlas der Haut- und Geschlechtskrankheiten 913
Compulsion and Doubt 913
The Liver 914
Diseases of the Foot 914

MEDICINE AND THE LAW

The Courts and the Period of Gestation 926

PARLIAMENT

The Minister and Registrars 927
Question Time 927

OBITUARY

Sir Leonard Parsons 936
Henry MacCormac 937
Sydney Watson Smith 938

PUBLIC HEALTH

Poliomyelitis 938
Pest Destruction by Fog 938

NOTES AND NEWS

Manchester Registrars' Meeting .. 939
As Two Patients Saw Poliomyelitis 939

University of London 939
University of Bristol 939
University of Durham 939
University of Manchester 939
University of Edinburgh 939
University of Sheffield 939

Appointments 940
Births, Marriages, and Deaths ... 940

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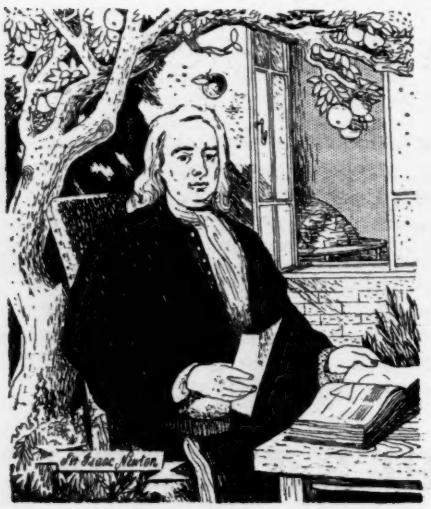

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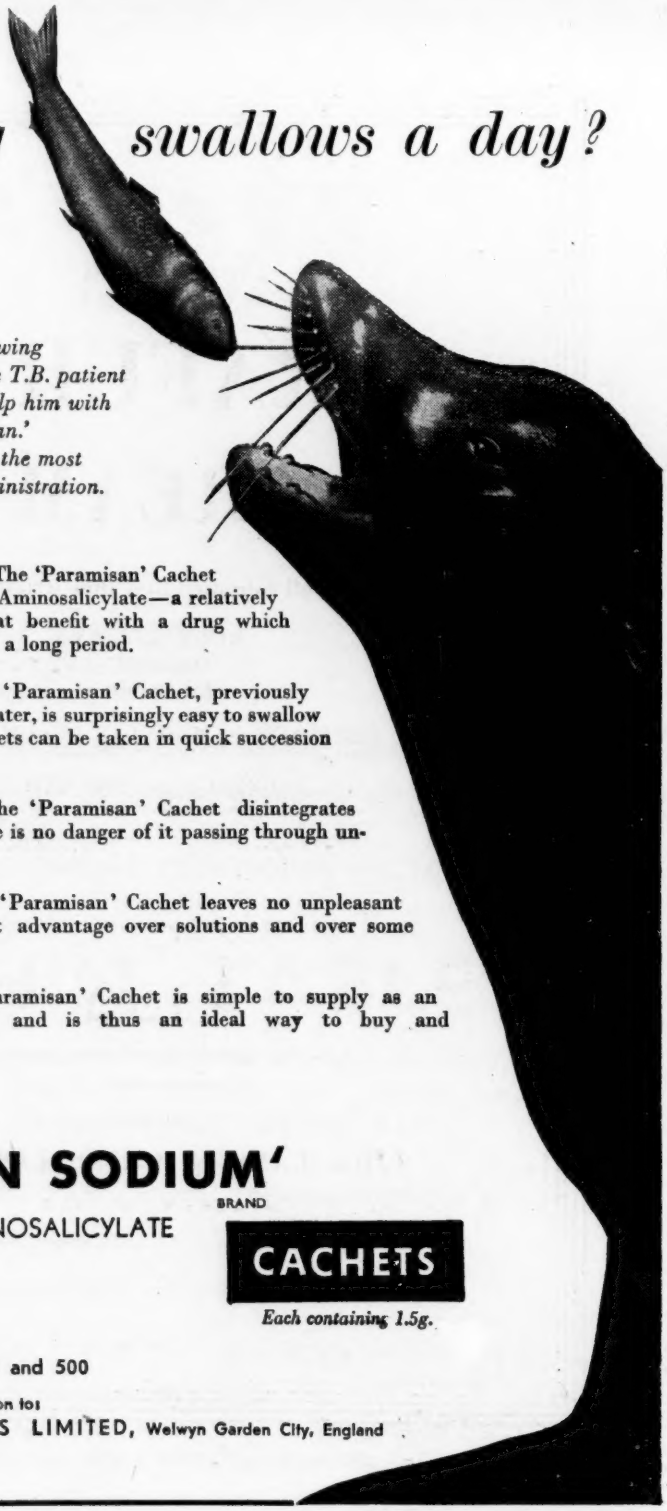

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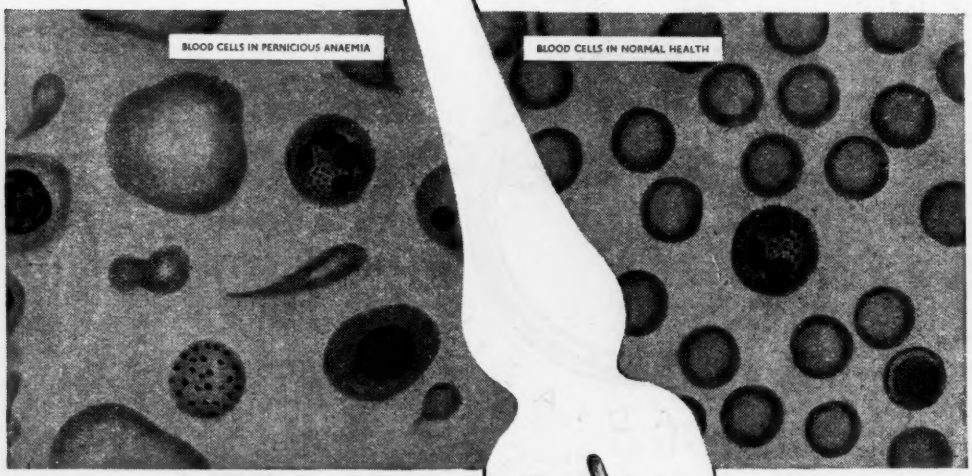

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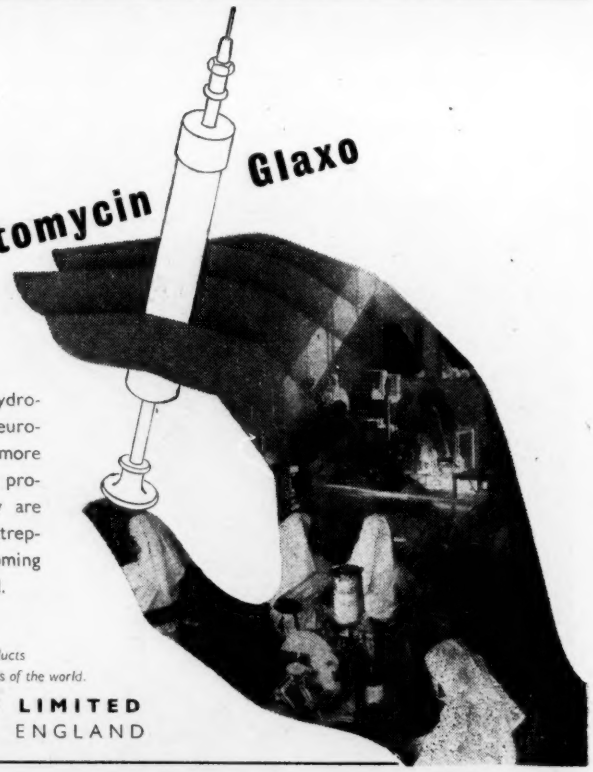

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SURGICAL RELIEF OF CONGENITAL CYANOTIC HEART-DISEASE

LATE RESULTS IN 72 CASES

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THE introduction of the Blalock-Taussig (1945) operation in the treatment of pulmonary stenosis marked the beginning of a new era in the handling of many cases of congenital cyanotic heart-disease. The original operation has been followed by modifications, such as those introduced by Potts et al. (1946), and there have been alternative methods of approach by a direct attack on the pulmonary narrowing or on the valve, as initiated by Brock (1948, 1949) and Sellors (1948).

Results of the operation have been published in several articles, and the series now presented may illustrate some of the developments in this form of surgery. Under the general heading of congenital cyanotic disease, Fallot's tetralogy provides by far the greatest number of examples; tricuspid atresia, transposition of the great vessels, and pure pulmonary stenosis are also encountered but much less frequently.

MATERIAL

This series consists of 72 cases in which operation was undertaken for the relief of the congenital cyanosis. These patients have all been followed up for at least six months. 30 were males, and 42 were females; 49 were in the age-group 5–15 years.

At the start it was felt that the ideal age for surgery was between 5 and 15 years, and this we still feel is the most satisfactory age-group, but younger children have been operated on without undue difficulty. In patients over 20 the operation did not go so smoothly, but successful anastomoses were made in 6 patients over this age, the oldest being 35.

The conditions for which operation was undertaken were:

Typical Fallot's tetralogy	65
Situs inversus and Fallot's tetralogy	2
Transposition of great vessels	2
Tricuspid atresia	1
Pulmonary stenosis only	2
	72

Associated abnormalities were:

Gross venous anomalies (e.g., bilateral venæ cavæ)	8
Right-sided aortic arch	18
Chest-wall deformity (absence of lowest segment of sternum)	19
Absent right pulmonary artery	1

At operation, wherever possible, a note was made of site of stenosis as judged by direct palpation after the pericardium had been opened. 20 patients were thought to have a valvular stenosis, and 45 an infundibular one. In 42 cases there was an obvious post-stenotic bulge in the common pulmonary trunk associated with unusually large right and left pulmonary vessels. We had the impression that the shape of this post-stenotic bulge was ovoid in the case of infundibular stenosis, but spherical beyond a valvular obstruction.

SIGNS AND SYMPTOMS

Cyanosis.—Two dominating features have been cyanosis and dyspnœa on exertion. Of the 72 patients, 56 were cyanosed at, or very shortly after, birth, and all had cyanosis and respiratory distress in the first year of life. The cyanosis was appreciable in all cases and extreme in some. It was closely related to the degree of polycythæmia, but not to the extent of the disability, for it was noticeable, particularly in older patients, that the greater the cyanosis the greater was the exercise tolerance; per contra, two adult patients in whom disability was extreme were only slightly cyanosed.

Dyspnœa and distress on exertion varied considerably in degree, extending from patients who were restricted to walking only 2–3 yards and had to be carried everywhere, to those who could walk slowly upstairs and even lead a normal though limited existence. In older patients the disability had often varied during their life; it had tended to lessen, and if they attained the age of 20 they could usually undertake some sedentary occupation.

Any classification of exercise tolerance is impracticable, because factors such as the speed of walking, the climate, and general health vary from patient to patient and from day to day. However, within broad limits our cases could be grouped by the distance they could walk without rest, as follows:

Less than 50 yards	21 cases
Less than 200 yards	29 „
Less than a mile	11 „
More than a mile	11 „

Squatting.—Associated with dyspnœa on exertion was the tendency to adopt a characteristic squatting position, which was present in 50 of our patients. Several of the adults had given up their earlier habit of squatting in favour of resting forward with their hands on their bent knees when they were out of breath.

Central Nervous System.—The general intelligence, we believe, was well up to average standards, two children having attained scholarships and the majority being bright and alert mentally. However, 4 were definitely subnormal, though their deficiency might have been partly due to lack of education. It must be admitted that the mentality of most of the children is abnormal owing to their unusual upbringing, as well as to their disability. These cyanotic children are particularly precious to their parents, and, like other writers, we noted that on all occasions where possible, before and after operation, both parents attended with the child at the outpatient clinic. Chronic cerebral anoxia probably contributed to their irritability and jumpiness, for, in spite of gross cardiorespiratory insufficiency, some children were unable to keep still during their waking hours. Another common feature was shyness, and an almost pathognomonic coyness, which usually disappeared soon after operation.

Clubbing of fingers of the characteristic "drumstick" pattern was present in all except 3, who showed arachnodactyly. After successful surgery the clubbing started to diminish and in most cases the nail-bed became loose and almost seemed to float on the terminal phalanx. The maximum regression of clubbing took from nine months to a year to occur.

Deformity of the chest was another frequent coincident feature in the series, and in 19 patients—i.e., over a quarter of the total—the lowest piece of the sternum was absent. This led to funnel-chest in some cases, and to pigeon-breast in others. Bifid ribs and abnormalities in the spinal processes were also encountered.

INVESTIGATIONS

The degree of polycythæmia was variable, but the hæmoglobin, red-cell count, and packed cell volume were closely related, and any one of them could usually be predicted if either of the two others was known. In more than half the cases the hæmoglobin was between

130 and 170% (highest 200%). The highest red-cell count was 10,000,000 per c.mm. A platelet-count was done in most cases, and it was found that this did not rise proportionately with the red-cell count, and was with one exception within normal limits. This is significant, since a high platelet-count has been suggested as a possible cause of thrombosis in these patients. In this series there was evidence of postoperative thrombosis on only two occasions. The average oxygen saturation of the arterial blood was 66–71%.

Detailed radiological investigations and electrocardiography, were undertaken in all patients, but with no findings different from those described by other workers. The diagnosis was made on clinical grounds in most of the cases, and we now feel that cardio-angiography and catheterisation of the heart should be reserved for patients in whom there is doubt or difficulty in establishing a diagnosis. This is not to deny that these procedures are highly valuable, but we have found that most cases can be diagnosed by simpler clinical and radiological methods.

TYPE OF OPERATION

The first 3 patients were operated on through a right anterior approach, the right subclavian artery and the right pulmonary artery being anastomosed on the lines of Blalock's original description. Next we adopted a left posterolateral incision and implanted the left subclavian artery into the side of the left pulmonary artery. This was done, whichever side the arch of the aorta was situated, on 62 occasions, but a similar right-sided approach was used in the 2 cases of situs inversus. The operations for the 6 remaining patients included 2 pulmonary valvulotomies, 3 Pott's operations, and 1 right-sided end-to-end pulmonary-subclavian anastomosis. In this last case the original left-sided operation had failed for technical reasons: this accounts for the total of 73 operations in 72 patients. The original pulmonary valvulotomy has already been described (Sellors 1948), but the second, which ended fatally, was an attempted division of the valve through an incision in the dilated common pulmonary artery.

Our policy has been to attempt an anastomotic operation in Fallot's tetralogy, but to define, if possible, the site of stenosis in case a more direct attack on the narrowed area or valve seemed necessary at a later date. "Pure" pulmonary stenosis is undoubtedly best treated by valvulotomy.

TECHNIQUE

The brief outlines of the usual anastomotic operation are as follows:

The anæsthetic consists of small doses of thiopentone and curare with intratracheal gas and oxygen (ether and cyclopropane are not used), and to these agents are added a paravertebral block and incision infiltration with ½% procaine (without adrenaline). With the patient in the lateral position, the fourth rib is resected from the transverse process forwards to the anterior axillary line. The lung is retracted and the pericardium injected with 2–4 ml. of 2% procaine to reduce cardiac irritability. The left pulmonary artery is sought and dissected free, after any overlying small and tortuous vessels have been secured. The pericardium is next incised posterior to the phrenic nerve to allow the heart to be inspected and to free a greater length of pulmonary artery.

The subclavian artery is next carefully isolated from its origin up to the apex of the pleural cavity, where it gives off internal mammary, vertebral, superior intercostal, and thyroid axis branches. These or their variants are divided so that a good length of artery is available to be turned down over the aortic arch and approximated to the pulmonary artery. Unexpected and abnormal branches are commonly encountered and must not be ignored. A clamp is placed across the origin of the subclavian artery, and two control-clamps of the Blalock pattern are used to occlude the proximal and distal ends of the pulmonary artery. The adventitia is thoroughly removed from both vessels and an end-to-side junction made with an everting type of suture.

The lumen of the subclavian artery controls the size of the anastomosis, assuming that there is little or no narrowing at the suture line; but we have found that an apparently small opening, say of 2 or 3 mm. diameter in a small child, has given a much better functional result than might have been expected. The slight angulation of the subclavian artery over the aortic arch does not seem to interfere with the efficiency of the anastomosis, but with a right-sided arch and a left innominate artery the subclavian artery lies in a mechanically better position.

COMPLICATIONS

There is no doubt that increasing experience and coöperation between the various members of the team contribute to improved results. In our first 25 cases there were 6 deaths at or within a short time of operation, but in the subsequent 68 cases (not all included in this series) there has been only 3 fatalities. Similar observations have been made by other surgeons.

The causes of the 9 operation deaths varied. 2 patients died of cardiac irregularity in the early stages of the operation, 4 more died of probable heart-failure within twenty-four hours (no more obvious cause could be found at necropsy). There was 1 death from thrombosis at the anastomotic line, and 1 from a clotted hæmothorax which produced gross mediastinal displacement. In addition, there was 1 death three weeks after operation, thought to be due to cerebral thrombosis on the day that the child was due to return home.

Complications on the whole were uncommon, but some of these were alarming. Two patients both over 24 had large hæmorrhages of more than 6 pints shortly after operation. These were almost certainly due to a tear in the suture line as the large pulmonary artery became distended. A transfusion of blood and plasma was given immediately, but in one case the initial fall in blood-pressure led to ischæmia in the left arm, whose main artery had been ligated. The subsequent Volkmann's contracture made a corrective operation necessary. The other serious complication occurred in the oldest patient, aged 35, whose lung was affected by tuberculosis; after operation a tension pneumothorax persisted for some days in spite of continuous aspiration, and the temporary loss of lung function was followed by a slight hemiplegia presumably due to anoxia. There was 1 case of pleural infection. A transitory Horner's syndrome was observed in 16 patients. The skin wound in general healed badly in comparison with those of other thoracotomies.

RESULTS

Apart from these complications, the average postoperative convalescence was straightforward, and most of the children were discharged within 12–14 days with obvious clinical signs of improvement. The increase in exercise tolerance was the most marked feature and dated from the time of operation, progressively improving up to a period of 3 or 4 months, and in some cases with further benefit up to 6 or 9 months.

The cyanosis improved gradually after operation in most cases but often took from three to six months to reach its final level. Again the degree of improvement of the cyanosis bore little relation to the extent of the decrease of the disability. The reduction in polycythæmia was unpredictable, sometimes showing an early pronounced fall, and on other occasions altering only to a small extent over the first few months. The heart increased in size slightly as the left ventricle enlarged, but only in 3 cases has there been any considerable cardiac enlargement.

In several patients a fever developed postoperatively which was unassociated with leucocytosis and often persisted for two or three weeks. These children were unaffected by chemotherapy, and we could not find a cause in any of them for their persistent temperature.

Two patients returned (1 at three weeks and 1 at seven weeks postoperatively) with signs of cardiac failure associated with fever and tachycardia. In neither could we establish a diagnosis of infective endocarditis despite repeated blood-culture, but in both of them the fever responded to penicillin and the signs of cardiac failure disappeared. One of these patients had a large pericardial effusion. This complication has also occurred in 2 other cases but the effusion eventually cleared completely in both.

One patient (a woman of 22, weighing 16 stone), who was grossly cyanosed before operation and had a marked postoperative increase in exercise tolerance, died suddenly over a year later. Post mortem no cause of her death could be discovered. The heart showed a typical Fallot tetralogy with a patent adequate anastomosis. She had, however, had two previous attacks of brief unconsciousness from which she had recovered completely.

An accurate classification of the end-results is impracticable, because there are too many variable factors to be considered. All the patients and the parents benefit psychologically from the operation, and improvement has to be judged from the base-line of the original disability. We have regarded a good result as one in which a child has been able to take up ordinary school life, short of violent exercise, or in which an adult can earn his or her own living in a normal manner. Two children are particularly worthy of mention—one who played football and was getting into trouble for fighting, and another who failed to attend outpatients as it was the day of his school sports where he ran (allegedly) 100 yards in 12 seconds. Several adults who worked in factory or shop eight hours a day and found time to dance or swim have also been encountered. In this category we have placed 42 patients. An additional 22 were regarded as being considerably benefited in that they had much increased exercise tolerance but were still distressed on excessive exertion.

Of the remaining 7 patients, 2 could not be expected to benefit because the anastomosis was made erroneously in cases of transposition of the great vessels. The remainder did not improve appreciably for reasons unknown but probably owing to inadequacy of the artificial ductus. However, the parents of one of the transposition cases and of 2 others have expressed pleasure in the physical improvement of their child, though this may well be wishful thinking.

What the future holds for these patients cannot be determined, but the early results have proved most gratifying. If the artificial "ductus" does not give the desired effect or maintain the improvement, an anastomosis on the opposite side, or a direct attack on the stenosed area, may still be considered.

SUMMARY

A series of 93 patients have been operated on for congenital cyanotic heart-disease. There were 9 deaths consequent upon the operation, but the mortality was proportionately higher in the early cases than in the more recent ones. The majority of cases were examples of Fallot's tetralogy.

Of these patients, 72 have been followed up for six months or more. The clinical features and investigations are briefly described.

The technique adopted in most cases was the performance of a left end-to-side Blalock type of anastomosis between the pulmonary and subclavian arteries using a posterolateral approach. The pericardium was routinely opened and the heart and site of the stenosis examined.

The end-result as judged through periods ranging from six months to two and a half years were gratifying. 1 patient died suddenly a year after operation, and 7 were regarded as not improved; but very marked benefit was obtained by 42 patients who were previously severely disabled, and a further 22 gained considerable benefit in exercise tolerance and general health.

REFERENCES

Blalock, A., Taussig, H. B. (1945) *J. Amer. med. Ass.*, **128**, 189.
Brock, R. C. (1948) *Brit. med. J.* i, 1121.
— (1949) *Ibid*, ii, 399.
Potts, W. J., Smith, S., Gibson, S. (1946) *J. Amer. med. Ass.* **132**, 627.
Sellors, T. H. (1948) *Lancet*, i, 988.

PULMONARY HYPERTENSION IN MITRAL STENOSIS

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BEFORE direct measurement of the pressure in the pulmonary artery and right ventricle of patients with mitral stenosis was made possible by cardiac catheterisation, the state of the pulmonary circulation was deduced from indirect evidence. Breathlessness on exertion, paroxysmal dyspnœa, hæmoptyses, accentuation of the pulmonary second sound, increased prominence of the pulmonary vascular shadows, dilatation of the pulmonary artery, enlargement of the right ventricle, and electrocardiographic changes were accepted as indicating increased pressure in the lesser circulation. Renewed interest in the surgical treatment of mitral stenosis has made it advisable to determine how far these symptoms and signs are a reliable guide to the extent of pulmonary hypertension.

The pressure in the pulmonary artery and right ventricle * of patients with mitral stenosis has been measured by a number of workers. Bloomfield et al. (1946) found increased right ventricular pressures in 5 patients with mitral stenosis, of whom 4, who had right-sided failure or were just recovering from it, had pressures ranging from 85/16 to 103/29 mm. Hg (upper limit of normal 30/4); in the 5th, who had never had right-sided failure, there was a less pronounced rise of pressure (43/2 mm. Hg). Few clinical details were given concerning these patients, and no attempt made to correlate the physical findings with the pressure measurements. Similarly Lagerlof and Werko (1949a) give few details of their 5 patients, 2 of whom had aortic incompetence in addition to mitral stenosis. 2 patients were not in failure, the pulmonary-artery pressure being normal in one and slightly elevated in the other; the other 3 had peripheral venous congestion with high pulmonary pressures. Harken et al. (1948, 1950), Bland and Sweet (1949), Bailey et al. (1950), and Baker et al. (1950) report the right ventricular or pulmonary-artery pressures in 17 patients selected for surgical relief of mitral stenosis. Most were under 40; their symptoms were predominantly pulmonary; and only 5 had had systemic congestion. Those with pulmonary

* The *systolic* pressures in the right ventricle and pulmonary artery are identical.

TABLE I—FINDINGS IN 22 CASES OF MITRAL STENOSIS

Case no.	Age (yr.)	Sex	Lesion	Rhythm	Systemic venous congestion	Right ventricular pressure (mm. Hg)			Pulmonary-artery pressure (mm. Hg)			Blood-pressure (mm. Hg)	Cardiac output (litres per min.)
						Systolic	Diastolic	Mean	Systolic	Diastolic	Mean		
1	28	F	M.S., A.I.	S.R.	−	17	0	9	..	..	..	120/70	6·0
2	49	F	M.S., A.I.	A.F.	−	17	4	10	..	..	21	130/90	2·6
3	37	F	M.S.	A.F.	−	24	1	8	..	..	..	112/78	3·6
4	50	F	M.S.	A.F.	−	25	0	10	30	9	17	210/105	4·0
5	41	F	M.S.	A.F.	−	29	0	14	..	..	..	125/85	3·5
6	58	F	M.S.	A.F.	−	32	3	16	..	..	..	160/90	3·4
7	33	F	M.S., T.S., A.I.	S.R.	−	33	0	15	28	11	21	120/100	..
8	48	F	M.S., A.I.	A.F.	−	35	0	15	..	..	..	155/80	2·6
9	57	F	M.S.	S.R.	−	35	0	16	..	..	..	106/62	4·6
10	52	F	M.S., M.I., A.I.	A.F.	+	36	8	17	36	16	28	114/80	2·2
11	30	F	M.S., A.I.	S.R.	−	38	4	20	..	..	..	120/70	5·0
12	43	M	M.S.	A.F.	+	41	4	19	38	23	30	120/85	3·3
13	49	F	M.S.	A.F.	−	44	4	23	..	..	..	108/70	3·6
14	65	M	M.S.	A.F.	+	46	11	23	..	..	..	170/85	3·2
15	32	M	M.S.	A.F.	−	53	6	23	53	26	35	123/76	5·6
16	32	F	M.S., M.I., A.I.	A.F.	−	..	..	..	54	29	42	134/90	3·6
17	45	F	M.S.	S.R.	−	54	2	31	54	45	51	110/80	3·8
18	36	F	M.S., A.I., T.I.	A.F.	+	66	15	32	..	..	..	120/70	3·0
19	46	F	M.S., A.I.	A.F.	+	92	10	30	92	35	55	150/90	3·1
20	26	M	M.S.	A.F.	−	92	1	32	120	53	77	140/65	3·6
21	23	F	M.S.	S.R.	−	92	9	44	82	55	68	110/75	..
22	29	M	M.S.	S.R.	+	105	14	52	..	..	..	108/84	3·1

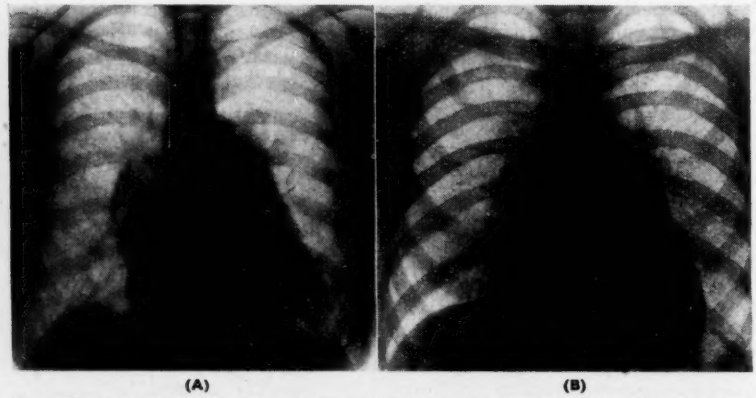
M.S. = mitral stenosis. M.I. = mitral incompetence. T.S. = tricuspid stenosis. T.I. = tricuspid incompetence. A.I. = aortic incompetence. S.R. = sinus rhythm. A.F. = auricular fibrillation.

symptoms only had markedly elevated pressures, which in 2 exceeded the systemic arterial pressure. In addition to left atrial enlargement, many had an enlarged right ventricle with prominence of the conus region and often increased vascular markings. The electrocardiogram usually showed right axis deviation or right ventricular hypertrophy, but no particular correlation was made between the radiological and electrocardiographic findings and the extent of pulmonary hypertension.

Borden et al. (1950) have correlated the pulmonary-artery pressure with the functional state of 30 patients with mitral stenosis, 10 of whom had aortic incompetence without significant enlargement of the left ventricle. There was a rough direct correlation between the pressure and the patient's functional capacity. Those who were partly or completely incapacitated by exertional dyspnœa usually had a high pulmonary-artery pressure and a 25% reduction in cardiac output. On fluoroscopy patients with normal or slightly raised pressures had a normal cardiac shadow or straightening of the left border of the heart with left atrial enlargement. Severe pulmonary hypertension was associated with enlargement of the pulmonary artery and right ventricle, and a reticular or finely mottled appearance of the lungs. Although the left atrium was enlarged, there was no exact correlation between the size of this chamber and the extent of pulmonary hypertension.

Hickam and Cargill (1948) have studied the effect of exercise on the cardiac output and mean pulmonary-artery pressure in normal subjects and in patients with mitral stenosis. In the former the cardiac output increased without any conspicuous rise in pulmonary-artery pressure. In the latter exercise produced a striking rise in pulmonary-artery pressure with little or no increase in cardiac output. Other workers have observed a similar response (Bland and Sweet 1949, Baker et al. 1950, Harken et al. 1950). The pulmonary-artery pressure depends on the cardiac output and the resistance offered by the left atrium and the pulmonary vascular bed. The rise in output without a proportionate increase in mean pulmonary-artery pressure, which is found in normal subjects, must signify a corresponding decrease in resistance to blood-flow through the lungs. Observations by Hamilton et al. (1939) in dogs and by Cournand (1947) in man suggest that this reduction in pulmonary resistance is due to the opening of new channels or the widening of those already open. In mitral stenosis the rise in pressure without a corresponding rise in cardiac output must be due to an increase in pulmonary vascular resistance.

Long-standing mitral stenosis may cause sclerotic changes in the pulmonary vascular bed (Parker and Weiss 1936, Larrabee et al. 1949), but how far these changes contribute to the rise in pulmonary-artery pressure at rest and on exercise is not yet known.



(A) (B)

Fig. 1—Postero-anterior teleroentgenograms of 2 patients with mitral stenosis: (A) patient no. 3 (right ventricular pressure at rest 24/1 mm. Hg); (B) patient no. 22 (right ventricular pressure at rest 105/14 mm. Hg). Both radiographs show marked prominence of the pulmonary artery and enlargement of the heart to right and left; in (A) enlargement of the left atrium was evident from the double contour on the right border. Although the resting ventricular pressure was normal in one patient and very high in the other, there is no significant difference in the cardiac outlines.

METHODS AND MATERIAL

The pressure in the right ventricle or pulmonary artery was measured by the technique described previously (Bayliss et al. 1950). We have used the right ventricular systolic pressure as a measure of the pulmonary-artery systolic pressure, and agree with Bloomfield et al. (1946) that the normal range is 18–30 mm. Hg. The slight difference between the pulmonary-

artery and the right ventricular systolic pressure in an individual patient is due to normal fluctuations as the catheter is moved from the ventricle to the pulmonary artery. The end diastolic ventricular pressure indicates the tension in the right ventricle just before contraction and closely parallels the right atrial pressure. The normal end diastolic pressure seldom exceeds 4 mm. Hg.

The effect of exercise was studied in a number of cases. The patient, remaining supine, carried out bicycling movements with his legs against manual resistance. When a steady state was reached, the oxygen consumption was measured by a Douglas bag and Haldane gas-analysis. Immediately after the exercise samples of arterial and mixed venous blood were taken simultaneously, and the right ventricular or pulmonary-artery pressure and the systemic arterial pressure recorded.

Of 22 patients who were studied, 13 had involvement of the mitral valve only; 9 had, in addition to mitral stenosis, other valvular lesions which were not regarded as playing a major part in the hæmodynamic state. Thus none of the patients with auscultatory evidence of aortic incompetence had peripheral signs of aortic reflux, although 5 (nos. 2, 10, 16, 18, 19) had slight or moderate left ventricular enlargement on fluoroscopy. One patient (no. 4) had associated systemic hypertension; but this did not influence the pulmonary-artery pressure, which was normal. Brief clinical details of each case are given in an appendix.†

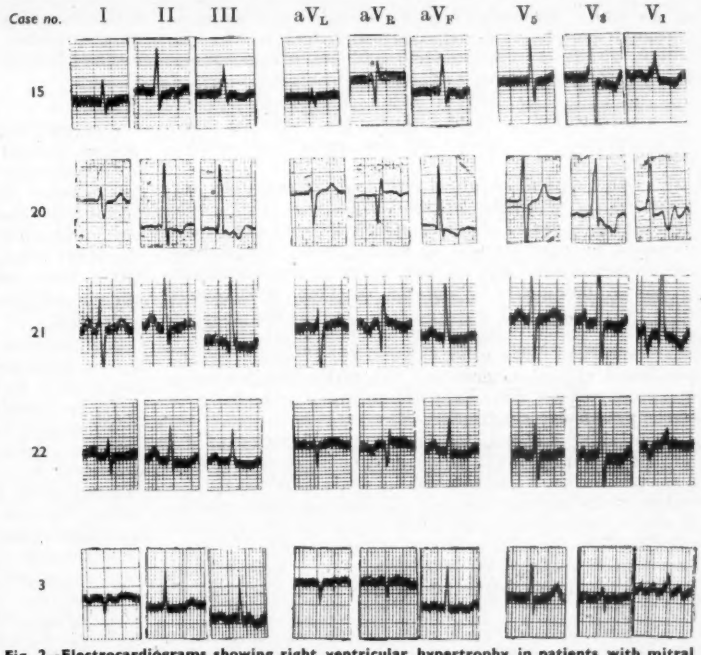


Fig. 2—Electrocardiograms showing right ventricular hypertrophy in patients with mitral stenosis. Patients nos. 15, 20–22 had severe pulmonary hypertension at rest. Patient no. 3 had a normal pressure at rest which rose to 85/13 mm. Hg on exercise.

RESULTS

In table I the cases are arranged in ascending order of their right ventricular systolic pressure at rest. In 5, pressures were within normal limits; in 17 there was pulmonary hypertension with systolic pressures ranging from 32 to 105 mm. Hg.

Relation of Clinical State to Pulmonary Pressure.—There was some correlation between exercise tolerance and the pulmonary-artery pressure, patients with normal systolic pressures usually being less incapacitated than those with raised pressures. There were, however, several exceptions. For instance, patient no. 3 had a normal right ventricular pressure at rest of 24/1 mm. Hg but was unable to do even light housework because of dyspnœa. In contrast, patient no. 16 had an increased pulmonary-artery pressure of 54/29 mm. Hg but was able to do her housework except for heavy lifting.

Of the 17 patients with pulmonary hypertension 11 had no evidence of peripheral venous congestion, although the hypertension was severe in 5, the pressure ranging from 53 to 92 mm. Hg. Of the remainder, 5 had obvious venous congestion with œdema at the time of observation, and the 6th (no. 22) had engorged neck veins but no œdema; their pulmonary-artery systolic pressures ranged from 36 to 105 mm. Hg, and they all had an increased end diastolic right ventricular pressure in keeping with venous congestion.

The 3 patients (nos. 20–22) with the highest pulmonary pressures presented a distinctive clinical picture. They were young; their symptoms were intense dyspnœa on slight exertion, orthopnœa, hæmoptyses, and episodes

† Multigraphed copies of this appendix are obtainable on application to THE LANCET office, 7, Adam Street, London, W.C.2.

TABLE II—EFFECT OF EXERCISE ON THE CARDIAC OUTPUT AND PRESSURES IN THE RIGHT VENTRICLE OR PULMONARY ARTERY IN MITRAL STENOSIS

Case no.	—	Right ventricular pressure (mm. Hg)			Pulmonary-artery pressure (mm. Hg)			Heart-rate per min.	Cardiac output (litres per min.)
		Systolic	Diastolic	Mean	Systolic	Diastolic	Mean		
3	Rest	24	1	8	..	..	..	82	3·6
	Exercise	85	13	45	..	..	..	138	3·7
4	Rest	25	0	10	30	9	17	60	4·0
	Exercise	..	..	..	34	12	26	70	4·0
6	Rest	32	3	16	..	..	..	72	3·4
	Exercise	45	8	19	..	..	..	84	..
11	Rest	38	4	20	..	..	..	91	5·0
	Exercise	56	7	29	..	..	..	100	..
15	Rest	53	6	23	53	26	35	58	5·6
	Exercise	105	10	51	93*	46	61	145	6·2
16	Rest	..	..	..	54	29	42	90	3·6
	Exercise	..	..	..	90	43	62	120	4·0
17	Rest	54	2	31	54	45	51	112	3·8
	Exercise	78	*3	43	..	..	..	140	3·1
20	Rest	92	1	32	120	53	77	70	3·6
	Exercise	..	..	..	105	84	97	140	3·5

* Following exercise, pulmonary-artery pressure was measured 4 min. after right ventricular pressure.

of so-called "bronchitis" with copious frothy sputum. Although peripheral venous congestion had occurred in 2 (nos. 20, 22) it was transient and not a conspicuous feature of their illness. Their condition deteriorated rapidly, and they died of pulmonary œdema within three years of the onset of symptoms. Until the onset of symptoms they often had had remarkable effort tolerance.

A further 5 patients (nos. 15–19) had severe pulmonary hypertension of similar degree (53–92 mm. Hg). One (no. 15) was a young man with a short history of marked dyspnœa on exertion and of hæmoptyses; his clinical picture was similar to that seen in the patients with the foregoing pulmonary symptoms without conspicuous right-sided failure. 2 patients (nos. 18, 19) had marked peripheral venous congestion and œdema at the time of observation. The other 2 (nos. 16, 17) were free of peripheral venous congestion; and although their main symptom was dyspnœa, they did not present the features of the pulmonary syndrome.

There was no correlation between the duration of the patient's symptoms and the degree of pressure increase. Thus patient no. 5 had had several episodes of congestive failure in the last ten years but still had a normal pressure at rest, whereas patient no. 20 had been free of symptoms until eighteen months before admission, and had a right ventricular pressure of 92/1 mm. Hg. Neither had peripheral venous congestion or œdema at the time of observation.

Fluoroscopy.—Left atrial enlargement was present in all patients except one (no. 1), but there was no correlation between its extent and the degree of pulmonary hypertension. The diagnosis of a significant degree of mitral incompetence was confirmed in 2 patients (nos. 10, 16) by systolic expansion of the left atrium.

Enlargement of the pulmonary artery was present in all patients (fig. 1). Every patient with pulmonary hypertension at rest showed right ventricular enlargement, which was most marked in those with the highest pressures. 2 patients (nos. 3, 8) with normal or nearly normal pressures at rest also had conspicuous right ventricular enlargement.

Electrocardiograms.—In 17 of the 19 patients in whom the electrocardiographic position could be determined, the heart was in a vertical or semi-vertical position with clockwise rotation. There was no correlation between the presence of auricular fibrillation and the degree of pulmonary hypertension. 7 patients had sinus rhythm; and, except for the patient with a normal pressure (no. 1), all had wide and notched P waves. There was a striking correlation between the presence of a very high pulmonary-artery pressure and electrocardiographic evidence of right ventricular hypertrophy, using criteria based on the findings of Wilson et al. (1941, 1947). The 4 patients with predominant pulmonary symptoms (nos. 15, 20–22) all showed right ventricular hypertrophy (fig. 2). One patient (no. 3) with normal resting pressures also had right ventricular hypertrophy (fig. 2); she had enlargement of the right ventricle on fluoroscopy, and her response to exercise is discussed below. 3 exceptions with marked pulmonary hypertension (nos. 16, 18, 19) did not show electrocardiographic evidence of right ventricular hypertrophy; their mitral stenosis was complicated by aortic incompetence with enlargement of both right and left ventricles.

Response to Exercise.—In contrast to normal subjects, in whom an increase in cardiac output occurs without a rise in pulmonary-artery pressure, all the patients who were exercised showed a significant increase in right-heart pressures (table II). The greatest increase occurred in patient no. 3, in whom a normal resting right ventricular pressure rose to 85/13 mm. Hg. These increases in pulmonary vascular pressure were not accompanied by a significant rise in cardiac output or in systemic arterial blood-pressure. It is clear therefore that this reaction resulted from an increase in pulmonary vascular resistance.

DISCUSSION

Clinical Recognition of Pulmonary Hypertension in Mitral Stenosis.—It is apparent that in patients with mitral stenosis the pulmonary vascular pressures range from normal to very high, and that cardiac failure with peripheral venous congestion is associated with elevated pulmonary-artery and right ventricular pressures. On the other hand, patients without congestive failure may have raised or normal pulmonary vascular pressures, and it is with this group that we are particularly concerned.

The presence of *severe* pulmonary hypertension at rest can be diagnosed from the clinical findings. The patients are usually in the third or fourth decade, and present a distinct syndrome characterised by episodes of acute pulmonary œdema, which may be precipitated by slight exertion or excitement. Similar cases have been well described by Gallavardin (1921) and by McGinn and White (1934). Milder pulmonary congestion is characterised by episodes, lasting 2–4 weeks, in which there is increased dyspnœa on exertion, orthopnœa, cough with expectoration of frothy sputum and occasionally hæmoptyses. Secondary infection, producing purulent sputum, may follow; and the condition then simulates acute bronchitis. Our patients died of pulmonary œdema within 2–3 years of the onset of symptoms, and peripheral venous congestion was not a conspicuous feature of the clinical course. On fluoroscopy there was considerable enlargement of the right ventricle in addition to prominence of the pulmonary artery and left atrium. There was also electrocardiographic evidence of right ventricular hypertrophy.

Patients with normal or moderately raised pulmonary vascular pressures also had diminished exercise tolerance. All had enlargement of the left atrium and pulmonary artery, but with one exception only those with pulmonary hypertension at rest had enlargement of the right ventricle. In the exceptional case (no. 3) whose exercise tolerance was much reduced, the right ventricular pressure was normal at rest, but there was right ventricular enlargement and electrocardiographic evidence of right ventricular hypertrophy. Mild exercise caused a threefold rise in the right ventricular pressure, and perhaps therefore during her normal daily activity this patient usually had pulmonary hypertension. Thus a normal pressure at rest does not eliminate the possibility of pulmonary hypertension with ordinary activity.

None of our patients with severe pulmonary hypertension had reticulation or mottling of the lungs. We have records of two patients, not included in this series, who had mitral stenosis and pulmonary hæmosiderosis. Their *mean* pulmonary-artery pressures were 25 and 29 mm. Hg respectively (normal 15 mm. Hg). They both gave a history of recurrent and often severe hæmoptyses over a period of nine years, but dyspnœa was minimal. They did not have any of the other clinical features of patients with severe pulmonary hypertension.

Mechanism of Pulmonary Hypertension.—The primary factor responsible for the development of pulmonary hypertension in mitral stenosis is the mechanical obstruction offered by the diseased valve. This is apparent from the narrowing of the valve orifice, the congestion of the pulmonary veins, and the histological changes found in the pulmonary capillaries. Direct measurement at operation on patients with severe mitral stenosis has confirmed that the left atrial pressure may reach as high as 30–40 mm. Hg (Bland and Sweet 1949). By passing a catheter through the right heart so as to occlude a distal branch of the pulmonary artery, Hellems

TABLE III—PULMONARY-ARTERY AND PULMONARY CAPILLARY PRESSURES IN 5 CASES OF MITRAL STENOSIS

Case no.	Mean pulmonary-artery pressure (mm. Hg)	Mean pulmonary capillary pressure (mm. Hg)	Mean pulmonary-artery/pulmonary capillary gradient (mm. Hg)
Normal values	15	10	5
2	21	17	4
10	28	21	7
12	30	23	7
16	42	23	19
17	51	36	15

et al. (1948, 1949), and Hickam (1949a and b) have measured the pressure in the pulmonary "capillaries" of normal subjects, and shown in dogs and in man (with atrial septal defects) that this is closely parallel to the pressure in the left atrium. The normal mean pulmonary "capillary" pressure by this technique is 10 mm. Hg (range 7–15 mm. Hg). In mitral stenosis Lagerlof and Werko (1949b) and Dexter et al. (1950) report values ranging from 18–40 mm. Hg—further evidence of the increased pressure in the left atrium and pulmonary veins.

However, the anatomical factor alone cannot account for all the increase in pulmonary-artery pressure, because (*a*) without a change in cardiac output the pressure rises on exercise, and (*b*) the presence or absence of failure may raise or lower the pressure, presumably without change in the size of the stenosed orifice (Bloomfield et al. 1946; our own observations). In these circumstances there is an increase in pulmonary vascular resistance which is reversible.

Dexter et al. (1950) have shown that with lesser degrees of pulmonary hypertension the pulmonary-artery pressure is increased in proportion to the pulmonary "capillary" pressure, and that the pressure-gradient from the pulmonary artery to the pulmonary "capillaries" and the pulmonary arteriolar resistance are normal. This indicates that lesser degrees of pulmonary hypertension are due to the obstruction offered by the stenosed valve. With more severe pulmonary hypertension, however, the pulmonary-artery pressure is raised out of all proportion to the rise in pulmonary "capillary" pressure, indicating an increase in pulmonary arteriolar resistance. Our own limited observations confirm these findings (table III). Thus it seems that increased pulmonary arteriolar resistance plays an important part in the development of *severe* hypertension in mitral stenosis. This increased resistance may be due to pulmonary arteriolar vasoconstriction or to structural changes in the vessels. Parker and Weiss (1936) have described in detail the histological changes in the lungs of patients with the clinical features of severe pulmonary hypertension. In the 2 patients (nos. 20, 22) in our series who came to autopsy and had severe pulmonary hypertension, hyperplastic sclerosis and intimal thickening was present in some of the pulmonary arteries and arterioles (fig. 3), providing direct evidence of the possibility of structural changes playing a part in the increase in resistance. We are unable to determine the presence, or assess the significance, of a persistent pulmonary vasoconstriction; but it is likely that, as in essential systemic hypertension, an increase in arteriolar tone precedes permanent structural changes.

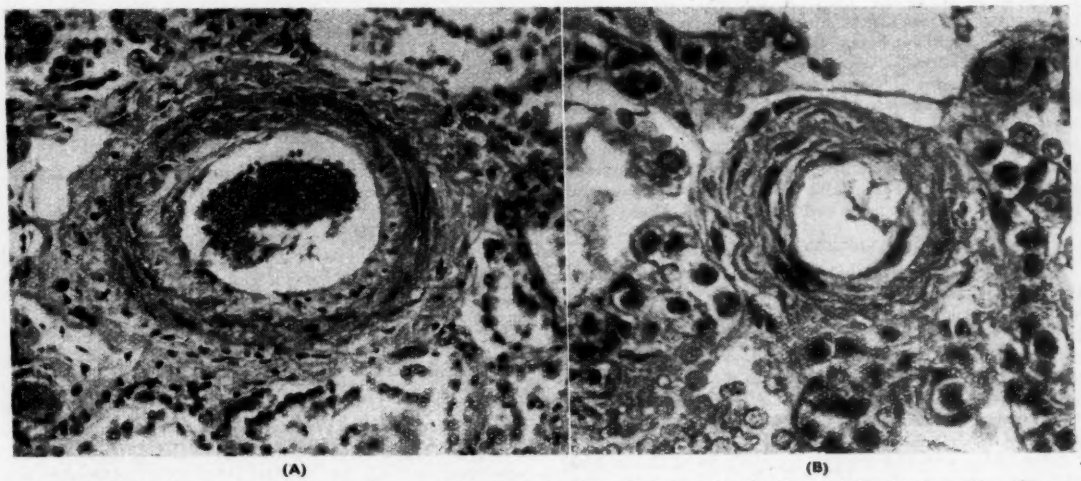
SUMMARY

In 22 patients with mitral stenosis the right ventricular and/or pulmonary-artery pressures have been correlated with clinical, radiological, and electrocardiographic findings. Pulmonary hypertension at rest was found in 17 patients. In general, those with the most severe symptoms had the highest pressures, but the duration of symptoms was not related to the degree of pulmonary hypertension.

Patients with severe pulmonary hypertension without peripheral venous congestion presented a recognisable syndrome characterised by predominant pulmonary symptoms and electrocardiographic evidence of right ventricular hypertrophy. Patients with lesser degrees of pulmonary hypertension did not present characteristic features, but right ventricular enlargement on fluoroscopy was a constant finding. The degree of pulmonary hypertension, however, can be determined only by direct measurement.

Right ventricular enlargement was found in all patients with pulmonary hypertension. There was no relation between the size of the left atrium and the degree of pulmonary hypertension.

On exercise a striking rise in pulmonary-artery pressure occurred without a significant increase in cardiac output. The pulmonary hypertension at rest and on exercise is due to stenosis of the mitral valve and to



(A) (B)

Fig. 3—Patient no. 22, with severe pulmonary hypertension. (A) Small pulmonary artery showing fibrous intimal endarteritis; the surrounding alveoli are filled with heart-failure cells (× 205). (B) Pulmonary arteriole showing gross intimal fibroblastic hyperplasia; the adjacent intra-alveolar capillaries are distended (× 580).

increased pulmonary arteriolar resistance. The relative importance of these two factors is discussed.

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REFERENCES

Bailey, C. P., Glover, R. P., O'Neill, T. J. E. (1950) *J. thorac. Surg.* **19**, 16.
Baker, C., Brock, R. C., Campbell, M. (1950) *Brit. med. J.* i, 1283.
Bayliss, R. I. S., Etheridge, M. J., Hyman, A. L., Kelly, H. G., McMichael, J., Reid, E. A. S. (1950) *Brit. Heart J.* **12**, 317.
Bland, E. S., Sweet, R. H. (1949) *J. Amer. med. Ass.* **140**, 1259.
Bloomfield, R. A., Lauson, H. D., Cournand, A., Breed, E. S., Richards, D. W. (1946) *J. clin. Invest.* **25**, 639.
Borden, C. W., Ebert, R. V., Wilson, R. H., Wells, H. S. (1950) *New Engl. J. Med.* **242**, 529.
Cournand, A. (1947) *Bull. N.Y. Acad. Med.* **23**, 27.
Dexter, L., Dow, J. W., Haynes, F. W., Whittenberger, J. L., Ferris, B. G., Goodale, W. T., Hellems, H. K. (1950) *J. clin. Invest.* **29**, 602.
Gallavardin, L. (1921) *Arch. Mal. Cœur.* **14**, 262.
Hamilton, W. F., Woodbury, R. A., Vogt, E. (1939) *Amer. J. Physiol.* **125**, 130.
Harken, D. E., Ellis, L. B., Ware, P. F. (1948) *New Engl. J. Med.* **239**, 801.
— — Norman, L. R. (1950) *J. thorac. Surg.* **19**, 1.
Hellems, H. K., Haynes, F. W., Dexter, L. (1949) *J. appl. Physiol.* **2**, 24.
— — — Kinney, T. D. (1948) *Amer. J. Physiol.* **155**, 98.
Hickam, J. B., Cargill, W. H. (1948) *J. clin. Invest.* **27**, 10.
— (1949a) *Ibid.* **28**, 788.
— (1949b) *Amer. Heart J.* **38**, 801.
Lagerlof, H., Werko, L. (1949a) *Acta cardiol.* **4**, 1.
— — (1949b) *Scand. J. Lab. clin. Invest.* **1**, 147.
Larrabee, W. S., Parker, R. L., Edwards, J. E. (1949) *Proc. Mayo Clin.* **24**, 316.
McGinn, S., White, P. D. (1934) *Amer. Heart J.* **9**, 697.
Parker, F., Weiss, S. (1936) *Amer. J. Path.* **12**, 573.
Wilson, F. N., Johnston, F. D., Cotrim, N., Rosenbaum, F. F. (1941) *Trans. Ass. Amer. Phys.* **56**, 258.
— Rosenbaum, F. F., Johnston, F. D. (1947) Advances in Internal Medicine. New York; vol. II, p. 1.

17-KETOSTEROID EXCRETION IN THE DIAGNOSIS OF ENDOCRINE DYSFUNCTION

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TEN years have elapsed since Crooke and Callow (1939), finding that patients with secreting tumours of the adrenal cortex excreted large quantities of 17-ketosteroids (17-K.S.), suggested that estimation of these steroids might help in the diagnosis of such tumours. Since that time the original method of estimation (Callow et al. 1938) has been modified by various workers, and steroids have been estimated in many different clinical conditions.

The precursors of these steroids are derived from the adrenals and testes, but their nature is unknown. Variations in adrenal and testicular function are reflected by alterations in the excretion of 17-K.S., and estimation of these in the urine has been used widely as a diagnostic aid. We discuss here how far such estimations are useful in the diagnosis of endocrine dysfunction.

METHOD AND CLINICAL MATERIAL

The neutral 17-K.S. values reported here were obtained by the polarographic method of Barnett et al. (1946a) and Butt (1950). All the estimations were made on 24-hour specimens of urine as soon as possible after collection. The accompanying table shows published normal figures, obtained by various methods, for males and females. The advantages of the polarographic method over colorimetric methods have been fully discussed by Barnett et al. (1946b).

Most of the patients were under the care of the medical staff of the London Hospital, but some estimations were performed on patients in other hospitals; for the latter the physicians in charge kindly supplied clinical details and other diagnostic findings. In all the cases the estimation was requested as an aid to the diagnosis of suspected endocrine dysfunction. Patients under the age of 14 and cases without clinical details or a definite diagnosis have been excluded.

RESULTS

The 235 cases that have been investigated are reviewed in three categories: (1) those in which an increase in 17-K.S. excretion was expected from the provisional diagnosis; (2) those in which a decreased excretion was expected; and (3) a miscellaneous group.

1. *Increase in 17-K.S. Excretion Expected*

The estimation was carried out in 127 cases as a test for adrenal cortical hyperfunction possibly due to a tumour. The patients were divided into two groups: (*a*) cases of hirsutism in women, occurring either alone or as part of a virilising syndrome; and (*b*) cases of obesity with a definite or tentative diagnosis of Cushing's syndrome. The results are shown in fig. 1.

In the group of hirsute women there was a pronounced difference in 17-K.S. excretion between those with excessive body and facial hair as the only feature and those with a more complete picture of virilism. Only 2 of the 30 women with hirsutism alone had an increased 17-K.S. excretion (25 and 26 mg. in twenty-four hours), whereas of the 28 patients with virilism 20 had an increased 17-K.S. excretion. Usually the increase in 17-K.S. excretion corresponded to the degree of virilism, but in 1 patient with a normal 17-K.S. output virilism was severe and laparotomy three years previously had shown adrenal hyperplasia. In 4 cases an ovarian disturbance was probably responsible for the virilism, since on exploration the adrenals were found to be normal and the ovaries diseased. In 1 of these an ovarian tumour of obscure histology was present and 17-K.S. excretion was normal. In the other 3 there was a high 17-K.S. excretion (20, 27, and 29 mg. in twenty-four hours); arrhenoblastoma of the ovary was found in 1 case, and sclerosis of the ovaries—syndrome of Stein and Leventhal (1935)—in the 2 others.

The patients with obesity were classified in three clinical groups: (*a*) simple obesity with or without minor endocrine stigmata (41 cases); (*b*) syndromes somewhat resembling Cushing's syndrome (15 cases); and (*c*) classical Cushing's syndrome (13 cases). In simple obesity 17-K.S. excretion was 1·5–34·0 mg. in twenty-four hours without apparent relation to any clinical signs of endocrine dysfunction. Of the 15 patients with benign or chronic conditions resembling Cushing's syndrome 14 had an increased excretion (maximum 33 mg. in twenty-four hours), but again there was no correlation between the severity of the disturbance

COMPARISON OF "NORMAL RANGES" OF NEUTRAL 17-KETOSTEROID EXCRETION

Authors	No. of cases	Sex	Range (mg./24 hr.) (Mean + 2 × S.D.)	Method
Baumann and Metzger (1940) ..	11	M	9·0–21·0	Zimmermann-Callow
Patterson et al. (1942)	9	M	5·3–21·3	Zimmermann-Callow
Pincus and Hoagland (1943) ..	16	M	5·6–12·8	Zimmermann-Callow
Salter et al. (1946) ..	14	M	6·2–22·2	Pincus (1943)
Salter et al. (1946) ..	14	M	8·5–23·2	Modified Zimmermann
Barnett et al. (1946a)	24	M	10·9–20·5	Polarographic
Barnett et al. (1946b)	8	M	11·0–22·6	Polarographic
Drekter et al. (1947)	35	M	10·0–28·9	Modified Zimmermann
Forbes et al. (1947)	73	M	6·7–27·2	Fraser et al. (1941)
Patterson et al. (1942)	12	F	1·4–13·4	Zimmermann-Callow
Salter et al. (1946) ..	14	F	2·1–13·7	Pincus (1943)
Salter et al. (1946) ..	14	F	3·0–13·0	Modified Zimmermann
Barnett et al. (1946a)	20	F	4·3–19·5	Polarographic
Barnett et al. (1946b)	20	F	3·8–22·6	Zimmermann-Callow
Forbes et al. (1947)	65	F	3·8–16·9	Fraser et al. (1941)

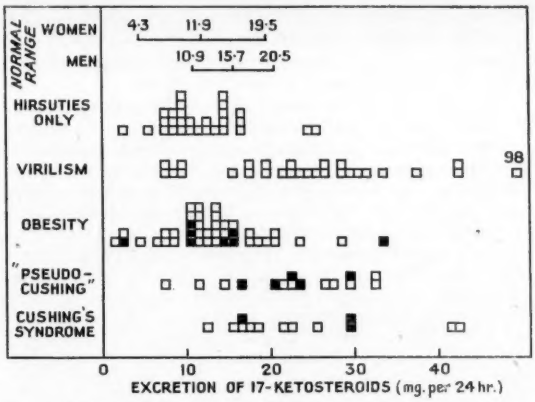

Fig. 1—17-K.S. excretion in cases in which suprarenal overaction was suspected: white squares, female; black squares, male.

and the 17-K.S. output. Of the 13 cases of Cushing's syndrome 7 showed a moderately increased 17-K.S. excretion, the maximum being 43 mg. in twenty-four hours in a woman with basophilism and virilism. Normal 17-K.S. excretion was found, however, in 2 fatal cases of florid basophilism. Fig. 1 shows that obese patients with the clinical features of Cushing's syndrome show a group tendency to increased 17-K.S. output compared with patients with simple obesity, but the estimation has a very limited value in the individual case. A more consistent difference is found between cases of virilism and simple hirsuties, but here again there are individual exceptions.

In only 1 patient in the whole series was 17-K.S. excretion sufficiently high to support the diagnosis of secreting adrenal tumour. The excretion value rose to 98 mg. in twenty-four hours. On exploration adrenal hyperplasia alone was found. The adrenals were examined at operation or at necropsy in 9 other cases without any tumours being found, but adrenal hyperplasia was reported in 3 cases. In none of the remainder of the series did the subsequent clinical course provide any final proof of adrenal tumour.

2. *Decrease in 17-K.S. Excretion Expected* (fig. 2)

Addison's Disease.—In the 7 verified cases of Addison's disease there was a great decrease in 17-K.S. excretion, which was usually less than 1 mg. in twenty-four hours in women and less than 3 mg. in twenty-four hours in men. The diagnosis of Addison's disease was not substantiated in 6 patients tested, and 4 of these had normal levels of 17-K.S. excretion; the 2 others had severe chronic illness, and in both of them the 17-K.S. excretion was reduced to 2 mg. in twenty-four hours. In 1 case of Addison's disease determinations were made throughout pregnancy; the 17-K.S. excretion gradually rose from nil before pregnancy to a maximum of 14 mg. in twenty-four hours in the last month of pregnancy. After labour 17-K.S. excretion decreased rapidly in three days to nil.

Primary Pituitary Failure.—In 9 cases of Simmonds's disease (males), the 17-K.S. output was less than 2·5 mg. in twenty-four hours. In 20 cases where a diagnosis of pituitary failure was considered but finally excluded (including 8 cases of anorexia nervosa) only 1 had an output as low as this. In many cases, however, especially in severe anorexia nervosa and myxœdema, subnormal levels were found. In mild anorexia nervosa 17-K.S. excretion was normal but decreased with protracted malnutrition. Repeated estimations in 1 case complicated by pulmonary tuberculosis showed an eventual decrease to 1·2 mg. in twenty-four hours.

Simmonds's disease developed in 3 patients after severe post-partum hæmorrhage; in 1 case the 17-K.S. output was nil for the first four days of the puerperium and then increased gradually to 2 mg. in twenty-four hours and remained at this level until the clinical signs of hypopituitarism became obvious. In a small series of patients estimations performed in the immediate period after normal delivery showed a decrease in excretion compared with pre-partum levels but remained within the normal range.

Primary Testicular Failure.—In 7 eunuchoidal men with testicular atrophy 17-K.S. excretion was 5·5–11 mg. in twenty-four hours. Estimations were also done in 14 young adults with poor development of secondary sex characters (8 had gynæcomastia). Presumably no interstitial cells had been destroyed, because sexual maturity was attained later. In this group 17-K.S. output was 7–23 mg. in twenty-four hours. The only inference to be drawn from this small series is that cases of testicular atrophy show a group tendency to a low normal 17-K.S. excretion which is absent in cases of delayed puberty. In the individual case a low figure has no diagnostic value, but a high normal value (over 15 mg.) may be taken to indicate undisturbed testicular function.

3. *Miscellaneous Conditions*

Dwarfism.—In 13 cases of varying types of dwarfism associated with sexual infantilism 17-K.S. excretion was 0–11 mg. in twenty-four hours. In 3 of these cases dwarfism was due to destruction of the pituitary gland by a craniopharyngioma, and the values were 0, 0·7, and 2·3 mg. in twenty-four hours. In the 10 other patients the estimation was of no apparent diagnostic value.

Pituitary Tumours.—A normal result was obtained in 7 cases of *acromegaly*. The test was therefore of no value in confirming the diagnosis or in assessing the activity of the disease. In 7 cases of *chromophobe adenoma* of the pituitary gland the 17-K.S. excretion was 7·0–27·3 mg. in twenty-four hours, but these values could not be correlated with the clinical evidence of endocrine function; the highest value was found in a woman with no endocrine abnormalities. In this group 3 women presented with *amenorrhœa* and *obesity*, and in them the 17-K.S. excretion was 7·0–22·5 mg. in twenty-four hours.

Other Conditions.—Estimations were made in 9 cases of menstrual disturbances, 2 cases of pregnancy, 3 cases of thyrotoxicosis, 3 cases of aspermia or impotence, and

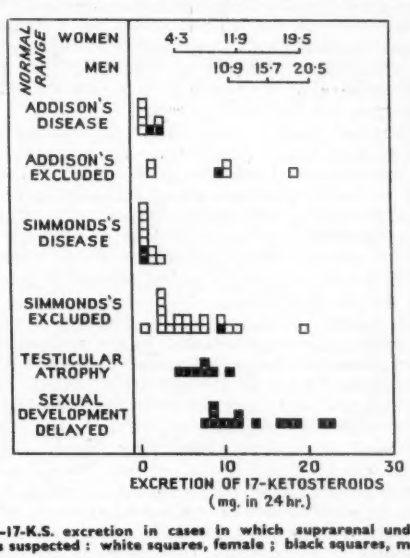

Fig. 2—17-K.S. excretion in cases in which suprarenal underaction was suspected: white squares, female; black squares, male.

1 case each of acne, hydatidiform mole, cutaneous striæ, and gigantism. A patient with severe pre-eclamptic toxæmia of pregnancy excreted 2·6 mg. of 17-K.S. in twenty-four hours. Excretion was normal in all the other cases, and in no instance did the estimation contribute to the diagnosis.

DISCUSSION

Correct interpretation of urinary 17-K.S. estimations obviously depends on the reliability of the method. In our experience the major cause of error has been inaccurate collection of urine samples. Since the result is expressed as output in twenty-four hours, a complete collection of urine over that period of time is essential. Unfortunately the importance of this is not always realised by patients and nurses.

Several factors other than endocrine disease may influence the 17-K.S. output. Excretion varies considerably with age, rising steadily from early puberty to a peak at the age of 25. It then declines with increasing age, slowly in the male and more sharply in the female, to reach a constant level in the mid-thirties, after which it decreases further in old age (Hamburger 1948). The output is diminished by about half in chronically ill, debilitated, or malnourished people (Forbes et al. 1947). Impairment of liver function also leads to decreased excretion (Fraser et al. 1941). Values above normal have been found on occasions in this laboratory in patients with simple obesity, carcinoma of the bronchus, and ankylosing spondylitis. Similar findings have been reported by Warren (1945) and Davison et al. (1947). Hormonal therapy may influence 17-K.S. excretion; testosterone causes a definite increase, but methyl testosterone produces no significant change (Frame et al. 1944). Deoxycortone does not seem to influence 17-K.S. excretion (Cuyler et al. 1942). Administration of œstrogens usually diminishes the high output in virilism.

The most common use of 17-K.S. estimation has been to test for increased cortical function in cases of suspected adrenal tumour. The estimation is of no value in the diagnosis of a non-secreting adrenal tumour unless both adrenal glands have been destroyed, causing Addison's disease. Most of the secreting tumours of the adrenal cause a considerable increase in 17-K.S. output, but with some such tumours the 17-K.S. excretion has been reported to be normal. As Kepler and Mason (1947) have shown, tumours producing true virilism are associated with a considerable increase in 17-K.S. excretion; but, if the tumour gives rise to Cushing's syndrome without virilism, a normal 17-K.S. excretion is not uncommon. Thus a normal value for 17-K.S. output may be taken to exclude the presence of a secreting adrenal tumour if virilism is present.

The range of 17-K.S. output with adrenal tumours with virilism is very wide, varying from 100 to 2000 mg. in twenty-four hours (Dorfman 1948). Amounts up to 100 mg. in twenty-four hours may be found in patients with virilism due to simple hyperplasia, as in 1 case in the present series. In patients who excrete so much 17-K.S. differential estimation is of value, since the B fraction is relatively higher in the presence of a tumour than in simple hyperplasia.

As the present series shows, the ætiology of virilism is both variable and obscure, and 17-K.S. estimation has only a restricted value in diagnosis. Increased 17-K.S. output may be found in patients with virilism due to ovarian disease—e.g., arrhenoblastoma (Goldberg et al. 1947)—where the adrenals appear normal. Virilism with adrenal hyperplasia may very occasionally be associated with a normal 17-K.S. output. Several workers have reported normal or only slightly increased 17-K.S. excretion in cases of active Cushing's syndrome (Fraser et al. 1941, Warren 1945, Escamilla 1949). From our own findings it is apparent that there is no relation between the degree of activity of Cushing's syndrome and the 17-K.S. output, and that determination of the 17-K.S. excretion is of no value in differentiating Cushing's syndrome from obesity due to other causes.

There is sometimes uncertainty in the interpretation of a very low 17-K.S. output determined by the colorimetric method. The polarographic method is sufficiently specific to give nil readings on blank specimens without introducing correction factors, which makes the test more reliable in the diagnosis of adrenal insufficiency. In males with Addison's disease the production of testicular steroids may confuse the interpretation, but in hypopituitarism the test is of equal value in both sexes. Confusion may also result from decreased 17-K.S. secretion in severe anorexia nervosa or in myxœdema, but in the present series 17-K.S. excretion was seldom as little as that found in true adrenal or pituitary failure. This confirms the work of Fraser et al. (1941).

In several conditions the 17-K.S. output proved of no diagnostic value. These include dwarfism (apart from hypopituitarism), acromegaly, chromophobe adenoma of pituitary, menstrual disturbances, hydatidiform mole, and aspermia.

The 17-K.S. excretion is an indirect measure of only one type of adrenal activity. Its estimation has its use in the assessment of endocrine function, but as a diagnostic aid it is of value in only two types of endocrinopathy: it is a reliable test for adrenal failure, either primary or due to pituitary failure; and it also provides confirmatory evidence of cortical overaction in patients with virilism whether due to tumour formation or to cortical hyperplasia.

SUMMARY

The results of 17-K.S. estimations on 253 patients with suspected endocrine dysfunction are reviewed. Variations in the 17-K.S. excretion due to factors other than endocrine disease are discussed.

The estimation proved of great value in the diagnosis of Addison's disease and Simmonds's disease, and provided a reasonable guide to the presence of adrenal hyperfunction in cases of virilism. It was of no value in the differential diagnosis of Cushing's syndrome from other causes of obesity.

The test does not assist materially in the diagnosis of other endocrine diseases.

REFERENCES

Barnett, J., Henly, A. A., Morris, C. J. O. R. (1946a) *Biochem. J.* **40**, 445.
— — — Warren, F. L. (1946b) *Ibid*, p. 778.
Baumann, E. J., Metzger, N. (1940) *Endocrinology*, **27**, 664.
Butt, W. R. (1950) *Lancet*, i, 208.
Callow, N. H., Callow, R. K., Emmens, C. W. (1938) *Biochem. J.* **32**, 1312.
Crooke, A. C., Callow, R. K. (1939) *Quart. J. Med.* **8**, 233.
Cuyler, W. K., Hirst, D. V., Powers, J. M., Hamblen, E. C. (1942) *J. clin. Endocrinol.* **2**, 373.
Davison, R. A., Koets, P., Kuzell, W. C. (1947) *Ibid*, **7**, 201.
Dorfman, R. I. (1948) in Pincus, G., Thimann, K. V., The Hormones. New York; p. 513.
Drekter, I. J., Pearson, S., Bartczak, E., McGavack, T. H. (1947) *J. clin. Endocrinol.* **7**, 795.
Escamilla, R. F. (1949) *Ann. intern. Med.* **30**, 249.
Forbes, A. P., Donaldson, E. C., Reifenstein, E. C. jun., Albright, F. (1947) *J. clin. Endocrinol.* **7**, 264.
Frame, E. G., Fleischmann, W., Wilkins, L. (1944) *Bull. Johns Hopk. Hosp.* **75**, 95.
Fraser, R. W., Forbes, A. P., Albright, F., Sulkowitch, H., Reifenstein, E. C. jun. (1941) *J. clin. Endocrinol.* **1**, 234.
Goldberg, M. B., Maxwell, A. F., Smith, P. M. (1947) *Ibid*, **7**, 11.
Hamburger, C. (1948) *Acta endocrinol.* **1**, 19.
Kepler, E. J., Mason, H. L. (1947) *J. clin. Endocrinol.* **7**, 543.
Patterson, J., McPhee, I. M., Greenwood, A. W. (1942) *Brit. med. J.* i, 35.
Pincus, G. (1943) *Endocrinology*, **32**, 176.
— Hoagland, H. (1943) *J. aviat. Med.* **14**, 173.
Salter, W. T., Cahen, R. L., Sappington, T. S. (1946) *J. clin. Endocrinol.* **6**, 52.
Stein, I. F., Leventhal, M. L. (1935) *Amer. J. Obstet. Gynec.* **29**, 181
Warren, F. L. (1945) *Cancer Res.* **5**, 49.

MILKMAN'S SYNDROME IN IDIOPATHIC STEATORRHŒA COMPLICATED BY REFRACTORY MACROCYTIC ANÆMIA

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"At times the bowel complaint is overlooked: the wasting, weakness, paleness are what is noticed, and are thought to be due to another than the true cause."—Samuel Gee (1888), The Cœliac Affection.

IN 1888 Gee described the stools of the "cœliac affection" and recognised that diarrhœa was by no means a necessary accompaniment: "it may be that the patient voids daily but one large loose whitish stinking stool." Nevertheless in practically every textbook of medicine the student is invited to believe that increased frequency of defæcation, at least in the morning, inevitably accompanies those anomalies of fat-absorption comprising the sprue syndrome and not uncommonly called the fatty diarrhœas. The truth is that, when diarrhœa does accompany the other classical qualities of the stool in the sprue syndrome—bulkiness, paleness, frothiness, offensiveness—the recognition of sprue is practically unavoidable. But it cannot be emphasised too strongly that the symptoms of the sprue syndrome may include nothing referable to the gastro-intestinal tract, and that the stools may be normal in frequency and in macroscopic appearance. In these circumstances quantitative analyses of fæcal fat, or preferably fat-balance studies, will be the only method of establishing the diagnosis and of revealing the true cause of cases presenting with one or more of the complications of the primary disorder—disturbances of erythropoiesis and of calcium and phosphorus metabolism being the most important.

The case reported here is notable for the minimal signs of primary intestinal disease and for the great severity of the secondary manifestations.

CASE-RECORD

A farm-labourer's wife, aged 29, was admitted to St. Thomas's Hospital on May 4, 1942, with twenty weeks' history of unproductive cough and loss of voice, and twelve weeks' history of dyspnœa on exertion. She thought she had lost weight in the previous few weeks. There was no hæmoptysis or other overt blood-loss, œdema of the ankles, or palpitations. Her periods were regular. Her appetite was fair, and her bowels were opened once daily, with stools of normal appearance. A week before admission a chest radiogram had shown no evidence of any lung lesion. Her sputum was free from tubercle bacilli. Apart from mastoidectomy in 1938 and appendicectomy in 1940 her health had been good. Her mother, father, and nine siblings were alive and well, but a brother, who had had epilepsy from early childhood, had died at the age of 34, the immediate cause of death being unknown.

On examination the patient was small and sallow, looking ill and older than her stated age. Her temperature was 98·6°F, pulse-rate 80, respirations 20 per minute. Her mucosæ were pale, and her tongue was clean, shiny, and cracked. There was no cheilosis or dysphagia. The nails were normal, and there were no abnormal lymph-nodes. The blood-pressure was 105/65. There was no clinical enlargement of the heart. A soft systolic murmur was heard which was maximal in the second left interspace at the sternal edge and transmitted to the apex. There were no abnormal signs in the chest. The spleen was easily palpable and firm. It was doubtful if the liver was enlarged. No masses were felt. The ocular fundi and the central nervous system were normal. Endoscopy of the nasopharynx showed evidence of a mild ethmoidal infection and chronic laryngitis.

Investigations.—A blood-count on May 5, 1942, showed red cells 1,980,000 per c.mm., Hb (Haldane) 40%, colour-index 1·01, white cells 2380 per c.mm., with a normal differential count, and reticulocytes less than 0·1%. A film of peripheral blood showed much anisocytosis and poikilocytosis, some polychromasia, and two hæmoglobinised megaloblasts. On May 7 the aspirated sternal marrow showed polymorphs 19·5%, lymphocytes 1·75%, monocytes 0·25%, eosinophils 1·75%, metamyelocytes 8·75%, neutrophil myelocytes 7·0%, eosinophil myelocytes 0·75%, transitional myeloblasts 0·5%, myeloblasts 0·75%, normoblasts A 8·0%, normoblasts B 8·5%, normoblasts C 8·25%, and megaloblasts 34·25%. The pathologist's report commented on the high proportion of megaloblasts, of which a third were hæmoglobinised, and described the appearance as "typical of pernicious anæmia." On the same day occult blood was found in the fæces. On May 8 a histamine test-meal was abandoned because the patient was uncoöperative. On May 13 a blood-count showed red cells 1,590,000 per c.mm., Hb 31%, colour-index 0·97, and icteric index 6. Occult blood was again found in the fæces.

Treatment and Progress.—Pernicious anæmia was diagnosed, and an initial intramuscular injection of 'Pernæmon Forte' 20 ml. was given.

May 18, 1942: the patient was very pale and looked ill. Hæmorrhages were seen round both optic discs. A blood-count showed red cells 1,460,000 per c.mm., Hb 30%, colour-index 1·03, and reticulocytes 4·4%.

May 19: a blood-transfusion of 1 pint was given, and a course of injections of pernæmon forte 2 ml. twice weekly instituted.

Further blood-counts on May 21 (red cells, 2,120,000 per c.mm., Hb 41%, reticulocytes 5·2%), and on May 28 (red cells 1,860,000 per c.mm., Hb 42%, reticulocytes 5·3%) having shown that there was no satisfactory response to liver therapy, a further blood-transfusion of one pint was given on May 30. Thereafter the position improved, and on June 11 the Hb had risen to 74%.

June 13: the patient complained of epigastric pain after food and was tender below the right costal margin. A barium meal, given on June 22, revealed an active prepyloric ulcer.

June 25: a blood-count showed red cells 4,100,000 per c.mm., Hb 84%, and colour-index 1·01, and the patient felt very well. At this stage, owing to war circumstances, she was discharged on pernæmon forte 2 ml. fortnightly, mist. ferri et ammon. cit. 1 oz. t.d.s., and Meulengracht's diet. In view of the refractoriness of the anæmia, the persistence of a colour-index greater than unity, and, more significant, the coexistence of a radiologically demonstrated gastric ulcer, the previous diagnosis of pernicious anæmia was considered to be almost certainly incorrect, but unfortunately there was no opportunity to investigate the case further at that time.

Follow-up.—During the first two years after her discharge the patient was seen at irregular intervals in the follow-up clinic, and her general condition remained fairly satisfactory. Her Hb level was well maintained between 94% and 110% on pernæmon forte 2 ml. fortnightly, which was reduced to 2 ml. monthly after three months. Her colour-index, however, remained persistently greater than 1. On two separate occasions she complained of soreness of her tongue, and examination showed it to be red and fissured, but this condition settled spontaneously. On Sept. 3, 1942 (two months after discharge) she had an attack of diarrhœa, with up to ten motions in 24 hours. The stools were bulky and dark (she was still taking iron). This attack lasted three weeks and gradually subsided. A year after discharge low backache developed, of which the significance was not appreciated at the time. This persisted with intermissions and was from time to time accompanied by aching pains behind both knees. Apart from some discomfort on percussion of the spines between T6 and T10 and pain in the same area on extremes of extension and flexion, no abnormal signs were elicited and the knee-joints remained clinically normal. Radiography of the spine at that time revealed no abnormality of either bones or joints. On Aug. 2, 1944, after two years' surveillance in the follow-up clinic, the patient was returned to the supervision of her own doctor, who continued her monthly liver injections. Iron was omitted and, having had no recurrence of epigastric pain, the patient had reverted to a normal diet. On Aug. 7, 1946, a further two years later, she was again sent to the clinic, being $4^1/_2$ months pregnant, pale, and dyspnœic. About three months previously her doctor had changed her liver prescription to 'Examen' 1 ml. fortnightly, and a blood-count showed red cells 4,350,000

per c.mm., Hb 62%, and colour-index 0·7. It was recommended that this dose of examen be doubled, and iron ('Fersolate' tab. 2 b.d.) given in addition.

Readmission.—The patient was readmitted thirty-four weeks later, having had a stillbirth twelve weeks previously, at full term. She was complaining that the intermittent pain in her back had become more persistent and severe over the past twenty-eight weeks, and there was now a similar pain across her shoulders and "a sort of pain" behind her knees and in her calves. Her legs felt weak and she could climb stairs only with difficulty. She had fallen on numerous occasions. Apart from these pains she felt very well. There had been no recurrence of diarrhœa. Her weight was steady.

On examination her skin was pale, but there was no pallor of her mucosæ. Her tongue was normal, and there were no abnormal lymph-nodes, and no abnormal signs in the chest. The systolic murmur heard during her first admission was unaltered. Her apex-beat was in the fifth interspace $3^1/_2$ in. from the midline. The blood-pressure was 105/75. The spleen was palpable 1 in. below the costal margin. The edge of the liver was not felt. Rectal examination was normal. The urine contained no abnormal constituents. The patient had a waddling gait suggesting a myopathy. There was a slight dorsal kyphosis with well-marked lumbar lordosis. There was tenderness on percussion over the whole dorsal spine, but movements were full. Flexion of the lumbar spine was limited by pain. Other joints were normal. No abnormality was found in the central nervous system. Spondylitis ankylopoietica was tentatively diagnosed.

Investigations.—On April 14, 1947, radiography of the pelvis and sacro-iliac joints showed fractures of both pubic rami and general decalcification of the pelvis. There was poor definition of the left sacro-iliac joint, but no definite change was seen. Radiography of the rest of the skeleton between April 16 and 23 showed pseudo-fractures of the upper third of the shaft of the left fibula and of the posterior aspect of the shaft of the right tibia, at the junction of the upper and middle thirds of the right and left ulnæ, of the axillary borders of both scapulæ, and of the middle third of the right femur. No change was found in the lumbar or the dorsal spine. The radiologist reported that the appearances were those of Milkman's syndrome. On April 18 a blood-count showed red cells 3,400,000 per c.mm., Hb 76%, colour-index 1·1, white cells 5400 per c.mm., normal differential count, slight anisocytosis, hæmatocrit 36, mean corpuscular volume 106 c.μ, mean corpuscular Hb 31 μμg., and mean corpuscular Hb concentration 29%. On April 24 a test-meal showed the presence of free hydrochloric acid. On April 29 the serum-calcium was 9 mg. per 100 ml., inorganic phosphorus 2·8 mg. per 100 ml., and alkaline phosphatase 57 Shinowara units per 100 ml. (normal 2·2–8·6 units). On May 6 aspirated sternal marrow contained Ferrata cells 2·0%, megaloblasts 2·25%, normoblasts A 4·5%, normoblasts B 8·0%, normoblasts C 12·75%, myeloblasts 0·75%, neutrophil myelocytes 16·25%, eosinophil myelocytes 4·50%, basophil myelocytes 0·25%, metamyelocytes 11·25%, transitional cells 19·75%, polymorphs 11·75%, eosinophils 1·0%, lymphocytes 4·0%, plasma cells 0·5%, and monocytes 0·5%.

Treatment and Progress.—On May 9, 1947, a course of proteolysed liver ('Hepamino' $^1/_2$ oz. t.d.s.) was started by mouth. Between May 10 and 13 58% of the daily intake (50 g.) of fat was absorbed. On May 11 the prothrombin index was 101%; dried fæces contained 53·4% of fat of which 55% was split. On May 27 a blood-count showed red cells 4,560,000 per c.mm., Hb 84%, and colour-index 0·92. Between June 10 and 13 41% of the daily intake of fat was absorbed. On June 12 the serum-calcium level was 8·0 mg. and inorganic phosphorus level 2·9 mg. per 100 ml.

Diagnosis.—Osteomalacia with Looser zones (Milkman's syndrome), due to idiopathic steatorrhœa and precipitated by the recent pregnancy.

Treatment was begun with high-potency 'Ostelin' 50,000 units t.d.s., with calcium gluconate 2 teaspoonfuls daily.

Progress.—After two weeks' intensive treatment there was an important subjective improvement: the bone and joint pains disappeared, and the patient was comfortable in bed for the first time for nine months. On July 10, 1947, after a month's treatment, there was early calcification at all the fracture and pseudo-fracture sites, with a generalised increase in bone density. On July 30, the serum-calcium was 9·0 mg. and inorganic phosphorus 4·8 mg. per 100 ml., and radiography showed excellent callus at all the fracture sites, with normal mineralisation elsewhere. Meanwhile the anæmia had responded slowly to the oral liver, and by Aug. 1 the Hb was 94%. The patient was discharged home the next day. During the whole of this second admission, and particularly after defective fat-absorption had been found, the naked-eye appearances of her stools were followed with interest and, although they were sometimes bulkier than normal and somewhat paler, they never, even distantly, approximated to the classical descriptions of the stools in sprue.

Follow-up.—Although the patient had been taught birth-control methods before her discharge, she became pregnant again sixteen weeks after returning home. It was decided that this pregnancy should be allowed to continue without any alteration in her maintenance therapy, except that intramuscular injections of 'Hepostab Forte' 4 ml. monthly were substituted for the hepamino, which had become nauseating, and iron (fersolate 2 tablets t.d.s.) was provided in addition. During the whole of this pregnancy the patient felt extremely fit, and on repeated estimations her serum-calcium and serum-inorganic phosphorus were within normal limits.

She was admitted to the obstetric ward on Aug. 17, 1948, owing to anxiety about a residual pelvic deformity, and there, on Sept. 5 after medical induction, a child weighing $4^1/_2$ lb. was born by high-forceps delivery. The puerperium was uneventful, and mother and child returned home seventeen days later.

DISCUSSION

In the light of subsequent events it is particularly unfortunate that this patient was not induced to swallow a Ryle's tube during her first admission. A diagnosis of pernicious anæmia cannot be certain in the absence of histamine-fast achlorhydria. This patient, however, before her premature but unavoidable discharge, provided circumstantial evidence that free acid was present, when she developed a radiologically demonstrable gastric ulcer.

In pernicious anæmia the coexistence of a simple gastric ulcer is so rare as to cast the gravest doubt on one or other diagnosis. In this case a malignant ulcer, although a well-recognised complication, was ruled out by the patient's subsequent progress. Free hydrochloric acid was demonstrated after a histamine test-meal on her second admission, but by this time the underlying but unrecognised steatorrhœa had led to osteomalacia of the third degree and verging on the fourth (Albright et al. 1946).

Cooke et al. (1948), presenting the hæmatology of 45 cases of idiopathic steatorrhœa, showed two main groups on examination of the blood films. The first and smaller group presented a macrocytic picture, with well-stained erythrocytes, closely resembling that of pernicious anæmia—there was, however, less poikilocytosis, and substantial numbers of target cells ("Mexican hat" cells) were present. In the second and larger group there was considerable variation in depth of staining and in cell size, the smaller cells tending to be hypochromic and the larger normochromic. Poikilocytosis was moderate in this group, and target cells were seen in most cases. Out of 21 cases at initial examination, the colour-index was greater than unity in 13, and in 8 of the 17 of these in which determinations were made the mean cell volume was greater than 105 c.μ. The sternal marrow was examined in 17 cases, and in 4 of these the marrow was hypercellular, megaloblastic, and indistinguishable from that seen in pernicious anæmia. The peripheral blood in these cases was macrocytic and fell into the smaller peripheral-blood picture group already described as closely resembling pernicious anæmia. The second and commoner type of marrow showed erythroblastic hyperplasia with a mixture of deformed iron-deficiency normoblasts and large atypical erythroblasts. Attention has also been drawn to these large

erythroblasts by Innes (1948). They are smaller than megaloblasts but larger than typical normoblasts; the amount of nuclear condensation is not so great as in a normoblast with comparable hæmoglobinisation, and they have been described as "intermediate erythroblasts." This review of recent studies of the bone-marrow and peripheral blood in idiopathic steatorrhœa emphasises the difficulty for the pathologist in differentiating that condition from pernicious anæmia by hæmatological examination alone. In the first place a minority of cases will be virtually indistinguishable, having a megaloblastic marrow and macrocytic peripheral-blood picture. It is true that there may be less poikilocytosis than is normally seen in pernicious anæmia, and a variable number of target cells may be present, but neither of these can be regarded as reassuring criteria for the pathologist. In the other and larger group, although the marrow is erythroblastic, very many cells are of the atypical intermediate type and may be mistaken for megaloblasts, leading to a diagnosis of pernicious anæmia, particularly if the colour-index is greater than 1 and the mean cell volume is increased. Confusion becomes greater if the patient has been treated with liver, because the bone-marrow of pernicious anæmia treated with an inadequate dosage of liver is commonly of the intermediate type.

The response to therapy is likely to raise suspicion of the correctness of a diagnosis of pernicious anæmia. The anæmia of idiopathic steatorrhœa is refractory to liver, and it is unusual to obtain normal maturation in those cases presenting with the intermediate erythroblastic type of bone-marrow, although cases with a megaloblastic marrow may develop into the intermediate type after liver therapy. In all cases there is usually a slow increase in the amount of hæmoglobin and red cells in the peripheral blood—although seldom up to normal levels. Even after protracted and massive administration of liver the marrow contains large numbers of intermediate erythroblasts, and this defective maturation is reflected in the peripheral blood, where persistent abnormalities of the erythron lead to a high colour-index (often greater than unity) and an increased mean corpuscular volume, even when, as in the present case, the hæmoglobin has been raised to over 90%. In this case it will have been noted that the bone-marrow was megaloblastic on the patient's first admission, but five years later, after liver therapy throughout that period, it had become "normoblastic." Since the mean corpuscular volume was still 106 c.μ, probably at least some of the "normoblasts" were in fact cells of the intermediate erythroblast type. Further evidence of erythron abnormality, even after treatment, is provided by increased erythrocyte resistance to hypotonic saline. Cooke et al. (1948) made fragility tests on 18 cases of idiopathic steatorrhœa and found that, with one exception, their resistance was increased, and this increase was independent of the degree of anæmia. In 5 out of 6 cases, in which their treatment restored the number of red cells and Hb to normal, the resistance of the red cells was persistently increased. Since this finding notably differs from that in pernicious anæmia, treated or untreated, in which there is normal resistance, it may serve as a method of distinction, and should be used whenever there is doubt. The same may be said for the serum-bilirubin level, classically raised in pernicious anæmia but normal or insignificantly raised in the anæmia of idiopathic steatorrhœa. But these points will only be subordinate; because, whenever there is any doubt, investigations must be directed to the bowel function, even when, as in the present case, there is no overt evidence of any anomaly in absorption of fat.

Although most cases of idiopathic steatorrhœa present with obvious evidence of intestinal dysfunction—increased frequency of passage of bulky pale frothy offensive stools—a considerable number have only occasional episodes of diarrhœa, between which they may have a normal bowel habit or even constipation; and a still smaller number may for years betray their underlying disorder by nothing more dramatic than isolated and infrequent attacks of diarrhœa mistakenly regarded as simple gastro-enteritis. Such was the state of affairs in the present case. This is not surprising, for there is little evidence that steatorrhœa as such causes diarrhœa. Patients with idiopathic steatorrhœa and fluctuating periods of diarrhœa and constipation show no corresponding fluctuation in the amount of fæcal fat. Further, it is usually possible with folic acid to produce a reversion to normal bowel frequency in patients with idiopathic steatorrhœa accompanied by diarrhœa, and fat-balance studies before and after treatment commonly show no improvement whatever in fat-absorption (Davidson et al. 1947).

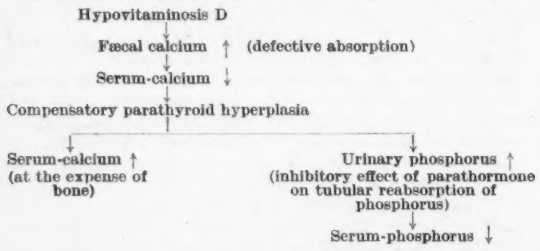
It is not unreasonable to suppose that, when diarrhœa develops in idiopathic steatorrhœa, it is symptomatic of some as yet unidentified part of the general deficiency pattern of this disease and is only coincidentally associated with an increased amount of fæcal fat; both being but symptoms of the underlying defect in bowel absorption. The fact that folic acid may control diarrhœa in certain cases of idiopathic steatorrhœa with anæmia without producing a hæmopoietic response suggests that it has at least two separate actions, the one concerned with bowel function, and the other with hæmopoiesis (Davidson and Girdwood 1947).

In most institutions the investigation of suspected steatorrhœa must at present depend on quantitative analyses of fæcal fat; but, since the amount of fæcal fat fluctuates greatly—depending, among other things, on the daily intake of fat—and, when expressed in percentages, varies inversely with the amount of unabsorbed non-fatty residue, many estimations must be made, with the patient on as standardised a diet as possible, before the results can be assessed. A far better method, where practicable, is that of fat-balance estimation (Cooke et al. 1946). In this test a percentage of absorption of less than 90% is abnormal. In the present case the percentage absorption was 58% on one occasion and 41% on the next. The ætiology of this patient's steatorrhœa has not been established. The only certain method of distinguishing between idiopathic steatorrhœa and fibrous pancreatitis is by duodenal intubation and estimation of the enzymal activity of the aspirated contents, and this has not been done. Secondary and less reliable assistance may be obtained from the glucose-tolerance curve, which tends to be flat in idiopathic steatorrhœa in contradistinction to that obtained in fibrous pancreatitis. The curve was flat in the present case.

Although steatorrhœa probably does not of itself produce diarrhœa, it is responsible for deficiencies of all the fat-soluble vitamins—A, D, E, and K (Albright and Stewart 1940). On her second admission there was no evidence of deficiency of vitamin K in our patient (prothrombin index 101%), but there were ample signs of hypovitaminosis D, for she had osteomalacia, aggravated by the calcium drain of her recent pregnancy but directly due to her steatorrhœa.

The usual variety of juvenile rickets is due to uncomplicated insufficiency of vitamin D, and this is also true of that form of adult rickets (osteomalacia) prevalent in China. Consequently these conditions respond to small doses of vitamin D. The same cannot be said for osteomalacia in the United States (Albright et al. 1946) or in the United Kingdom. Here again hypovitaminosis D is the commonest cause, but defective absorption is responsible and steatorrhœa the reason, if rare cases of raised resistance to vitamin D (McCance

1947) are excluded, and far larger doses of vitamin D are needed to produce a therapeutic response. Albright et al. (1946) have discussed the effects of hypovitaminosis D: and the following summary analyses the features relevant to the present case.


Hypovitaminosis D
Fæcal calcium ↑ (defective absorption)
Serum-calcium ↓
Compensatory parathyroid hyperplasia
Serum-calcium ↑ (at the expense of bone)
Urinary phosphorus ↑ (inhibitory effect of parathormone on tubular reabsorption of phosphorus)
Serum-phosphorus ↓

It will be noted that the result is a normal serum-calcium level with a diminished serum-phosphorus level. The body-fluids contain too little inorganic phosphorus for the level of calcium, and normal calcification is impossible. Osteomalacia results and, with it, increased osteoblastic activity leading to increased serum-alkaline phosphatase. The findings in the present case at the second admission illustrate this type of osteomalacia: serum-calcium 9·0 mg. per 100 ml., serum-inorganic phosphorus 2·8 mg. per 100 ml., and serum-alkaline phosphatase 67 Shinowara units (normal 2·2–8·6 units) per 100 ml.

Although hypophosphatæmic osteomalacia is the commonest form, the relative values of serum-calcium and serum-phosphorus depend on the parathyroid response to a lowered serum-calcium level, which itself is due to defective absorption. If hyperplasia is lacking, a normal serum-phosphorus level and a low serum-calcium level—not infrequently down to tetanic levels—results. If the response is partial, both serum-phosphorus and serum-calcium levels will be reduced. In all cases the serum-calcium and serum-phosphorus levels will be below normal, and osteomalacia will result. Attention must be drawn here to the futility of estimating the serum-calcium level alone when attempting to decide whether osteomalacia is present. Administration of vitamin D in sufficient dosage, provided the calcium intake is adequate, will restore calcium-phosphorus metabolism to normal and cure the osteomalacia. This result was rapidly attained in the present case with high-potency ostelin 50,000 units t.d.s. and calcium gluconate 2 teaspoonfuls daily.

Finally, radiography in the present case revealed appearances variously described as Milkman's syndrome or multiple spontaneous idiopathic symmetrical pseudo-fractures. In this condition the radiograms show ribbon-like bands of translucency in otherwise normal bone, often symmetrical and chronic, unless treated appropriately. Attention was first drawn to them by Looser (1920) as occurring in osteomalacic states, and they are often referred to as Looser zones. He considered them to consist of areas of uncalcified callus within the bone brought about by a "mechanical irritation due to strain" and by "small local infractions" (Looser 1940). Milkman (1934) described a case in which the bone lesions were unresponsive to therapy, thus differing from the German cases and constituting a new disease. McCullough (1940), on the other hand, thinks that they occur in many unrelated bone diseases and merely ndicate weakening or overloading.

Albright et al. (1946) think that, though superficially similar lesions may appear in other bone conditions, Milkman's syndrome only occurs in osteomalacia. They base this conclusion on four considerations: (1) "the symmetrical ribbon-like zones of decalcification seen by X ray, and often occurring in otherwise normal-appearing bone, are characteristic of that disease and that disease alone"; (2) "the serum calcium, phosphorus, and phosphatase findings in most of the undoubted cases are those of osteomalacia"; (3) "such patients respond to therapy based on the assumption that they have osteomalacia"; and (4) "the histopathology is that of osteomalacia." They separate osteomalacia into four degrees: (1) "chemical osteomalacia with normal phosphatase"; (2) "chemical osteomalacia with raised phosphatase"; (3) "Milkman's syndrome"; and (4) "advanced osteomalacia"—i.e., general skeletal demineralisation. They believe it justifiable to retain the radiological diagnosis of Milkman's syndrome to call attention to the fact that one can have underlying osteomalacia when the only X-ray evidence is the ribbon-like zones of decalcification.

The tendency for the pseudo-fractures of Milkman's syndrome to develop symmetrically and in particular positions—the femoral necks, the pubic and ischial rami, the upper third of the ulnæ, the ribs, &c., and, commonest, the axillary borders of the scapulæ—has aroused curiosity. Looser believed that they occurred at points of local stress or tension, and pointed out that such stresses are liable to be symmetrical. Le May and Blunt (1949), having analysed the sites of election of these pseudo-fractures, find that there is a close correspondence between them and the anatomical position of arteries passing adjacent to the bone—e.g., the commonest site of all is the axillary border of the scapula, where the circumflex scapular artery winds round in close apposition to the bone. They believe that, if pressure of arteries in certain circumstances can groove normal bone, it is not remarkable that osteomalacic bone would be affected, and that the "infractions" of Looser may be brought about in this way. This matter remains debatable.

SUMMARY

A case of occult steatorrhœa accompanied by grave disturbances of erythropoiesis and calcium-phosphorus metabolism is described.

The difficulties of differential diagnosis between pernicious anæmia and macrocytic anæmia due to idiopathic steatorrhœa are discussed.

The mechanism of production of osteomalacia resulting from hypovitaminosis D, with special reference to that type known as Milkman's syndrome, is outlined.

The importance of fat-balance estimations is emphasised.

The radiological appearance of Milkman's syndrome is described, together with a short review of the hypotheses relating to the sites of the pseudo-fractures (Looser zones) characteristic of the syndrome.

Owing to war-time dislocations this patient came under the care of several members of the staff of St. Thomas's, and my grateful thanks are due to them for permission to publish this case and for many helpful suggestions and criticisms.

REFERENCES

Albright, F., Stewart, J. D. (1940) *New Engl. J. Med.* **223**, 239.
— Burnett, C. H., Parson, W., Reifenstein, E. C. jun., Roos, A. (1946) *Medicine, Balt.* **25**, 399.
Cooke, W. T., Elkes, J. J., Frazer, A. C., Parkes, J., Peeney, A. L. P., Sammons, H. G., Thomas, G. (1946) *Quart. J. Med.* **15**, 141.
— Frazer, A. C., Peeney, A. L. P., Sammons, H. G., Thompson, M. D. (1948) *Ibid*, **17**, 9.
Davidson, L. S. P., Girdwood, R. H. (1947) *Brit. med. J.* i, 587.
— — Innes, E. M. (1947) *Lancet*, i, 511.
Gee, S. (1888) *St Bart's Hosp. Rep.* **24**, 17.
Innes, E. M. (1948) *Edinb. med. J.* **55**, 282.
Le May, M., Blunt, J. W. jun. (1949) *J. clin. Invest.* **28**, 521.
Looser, E. (1920) *Dtsch. Z. Chir.* **152**, 210.
— (1940) *Zbl. Chir.* **47**, 1470.
McCance, R. A. (1947) *Quart. J. Med.* **16**, 33.
McCullough, J. A. L. (1940) *Proc. Mayo Clin.* **15**, 785.
Milkman, L. A. (1934) *Amer. J. Roentgenol.* **32**, 622.

PRIMARY STREPTOMYCIN-RESISTANT TUBERCULOSIS IN A NEWBORN CHILD

SIMPLE METHOD OF ASSESSING STREPTOMYCIN RESISTANCE

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THE readiness with which some strains of *Mycobacterium tuberculosis* develop resistance to streptomycin during a protracted course of treatment is now well recognised, but it is only beginning to be realised that streptomycin-resistant strains may, on rare occasions, be isolated from patients before they have received any streptomycin (Cruickshank 1950). This possibility emphasises the necessity for routine testing of the streptomycin sensitivity of strains isolated before the inception of streptomycin therapy as well as during the course of treatment. The prognostic importance of this procedure is illustrated in the following case of miliary tuberculosis in a young infant, from whom tubercle bacilli highly resistant to streptomycin were isolated before the start of streptomycin therapy. We are also describing a new and simple method of determining the degree of resistance in such cases.

CASE-RECORD

A female infant, aged 11 weeks when admitted to the Royal Edinburgh Hospital for Sick Children on Aug. 4, 1948, was born at the Eastern General Hospital, Edinburgh, on May 20, five weeks premature, the second of binovular twins, and weighed 4 lb. 3 oz. at birth. She was breast-fed until the eighteenth day, when her mother, who had been running a remittent temperature since the eleventh day post partum, was suspected of having active tuberculosis. At that time the infant was thriving and weighed 4 lb. 13 oz. She continued to thrive on a fresh cow's milk mixture and weighed 6 lb. 1 oz. at 7 weeks. At 9 weeks she ceased to gain weight, though she still fed well and looked healthy for the next week. Her abdomen then became distended and examination revealed a greatly enlarged spleen and a moderately enlarged liver. In the last few days before her admission to the children's hospital she was feverish and taking her feeds badly.

Family History.—The child's parents were Irish. A miniature radiogram of the mother's chest taken during pregnancy was negative. She developed severe pre-eclamptic toxæmia in the thirty-first week of pregnancy and was admitted to the maternity unit of the Eastern General Hospital. On the tenth day of the puerperium she developed a remittent temperature and tachycardia; she had had a slight cough for several months and night sweating since the delivery of the twins; but no physical signs of disease were found in the chest. The pyrexia increased and on the eighteenth day she complained of a pleuritic pain in the left chest. Clinical and radiological examination then showed tuberculous infiltration at the left apex and an effusion at the left base. The baby was thereafter kept apart from the mother, who was transferred to a medical ward a week later. Repeated examinations of the mother's sparse sputum, including routine culture and one guineapig inoculation, were negative, as were examinations of gastric washings, stools, urine, and aspirated pleural fluid. Her general condition improved, but after five months in the medical ward tomograms still showed tuberculousin filtration of the left upper lobe and a small peripheral cavity. She refused artificial pneumothorax, and 46 weeks after the birth of her twins, she returned to her parents' home in Eire. Streptomycin was not given at any time during her hospital treatment. She had since returned to her own home in Edinburgh, but has consistently refused to attend a tuberculosis dispensary for examination. The father, however, had attended twice, and showed no evidence of tuberculosis.

The other twin, a boy, developed a volvulus of the small intestine and died after an operation when 5 days old.

Condition on Admission.—Small thin baby weighing 6 lb. 14 oz., with poor muscle tone, and several pustules on the scalp and trunk. No cyanosis or dyspnœa. Radiography showed miliary tuberculosis of the lungs (fig. 1). The abdomen was greatly distended, with slightly dilated superficial veins over the upper part. The spleen and liver were greatly enlarged, both extended to 3 finger-breadths below the costal margin, and both were firm with a smooth surface. No tubercles were ever seen in the optic fundi. Red-cell count 3,200,000 per c.mm., Hb 72%; white cells 16,600 per c.mm. A Mantoux test with O.T. 1 in 1000 was negative. Gastric washings did not show any tubercle bacilli on direct examination of concentrate smears, but human-type tubercle bacilli, which proved to be highly resistant to streptomycin, were grown on culture. Cerebrospinal fluid (C.S.F.) normal.

Treatment and Progress.—Streptomycin, 20 mg. per lb. body-weight per day, was begun three days after admission. Four-hourly injections of 25 mg. were given intramuscularly. The child fed well for her first six days in hospital and gained ½ lb. In the next few days her weight fell rapidly, though she still fed well. Her weight fell 1½ lb. to 5 lb. 14 oz. in the second and third weeks in hospital, and it then remained at about 6 lb. for many weeks until a few days before her death. The Mantoux test with O.T. 1 in 1000, when repeated eleven days after her admission, had become positive. She was apyrexial for her first five weeks in hospital, but later her temperature occasionally rose to 100°F. The C.S.F. was examined weekly and was always normal. Radiography of the chest a month after her admission showed diminution of the miliary mottling and some consolidation in the right upper lobe, and eight weeks after admission the liver and spleen had become much smaller, and radiography showed less pronounced mottling in the lungs but increased consolidation in the right upper lobe (fig. 2). Ten and a half weeks after the start of streptomycin therapy the dosage was changed to 50 mg. eight-hourly until the course was stopped two weeks later after twelve and a half weeks' treatment. During this last fortnight of therapy the streptomycin titre in the blood was estimated on several occasions: half an hour after injection blood-streptomycin level was 16 μg. per ml. on two occasions and 32 μg. per ml. on one occasion; four hours after injection it was 16 μg. per ml. on one occasion; and eight hours after injection it was 8 μg. per ml. on one occasion and less than 2 μg. per ml. on another. The erythrocyte-sedimentation rate remained raised throughout the illness, varying between 32 and 43 mm. per hour. A week after the end of streptomycin therapy gastric washings were collected on several occasions for examination for tubercle bacilli; the result was the same as that before the start of treatment, no tubercle bacilli being found on direct films, but tubercle bacilli of human type, highly resistant to streptomycin, being isolated on culture. The child's condition deteriorated and she died eleven days after the end of the streptomycin therapy, at the age of 25 weeks; her weight was only 5 lb. 3 oz. No further radiological changes had taken place in the chest. Permission for a necropsy was not given.

BACTERIOLOGY

A culture of tubercle bacilli isolated from gastric washings only a few days before death was available

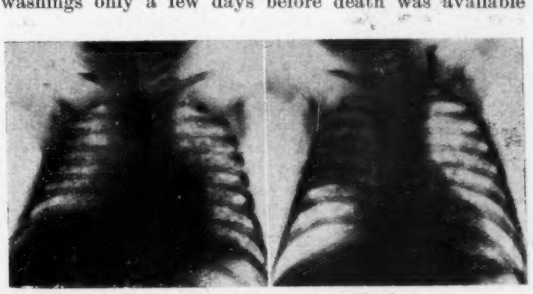

Fig. 1 Fig. 2

Fig. 1—Radiogram of chest before start of streptomycin therapy, showing diffuse mottling of miliary tuberculosis and some medial collapse of right upper lobe.

Fig. 2—Radiogram of chest eight weeks after start of streptomycin therapy, showing diminished mottling in lung fields and massive consolidation of right upper lobe.

for comparison of streptomycin sensitivity with the original culture similarly obtained at the time of admission to hospital. During the twelve and a half weeks between the isolation of these two cultures the patient had received about 11·6 g. of streptomycin, and it was hoped that a study of the organism might throw some light on the failure of the antibiotic to check the tuberculosis.

In the first instance both cultures were tested for streptomycin sensitivity by the Dubos method, which is routinely used in Medical Research Council trials. This method, which is widely applied, uses the detergent-containing medium of Dubos, in which, after one or more subcultures, the tubercle bacilli grow as a visible turbidity. A series of doubling dilutions of streptomycin is then added to bottles of the same medium, and, by a further subculture, the minimal dose required to inhibit growth is determined. The details of the test are given elsewhere (Medical Research Council 1948). Although the degree of streptomycin resistance of the great majority of strains of *Myco. tuberculosis* can be demonstrated by the Dubos method, the test is of limited value, since the range of concentration of streptomycin, which usually varies from 0·03 to 6 μg. per ml., may prove too narrow and the maximal concentration may not completely inhibit highly resistant strains. In the present case three separate tests on each specimen showed that there was no apparent inhibition of either of the patient's cultures, even by the highest concentration of 6 μg. per ml. of streptomycin. Since the control H37RV was uniformly sensitive to 0·5 μg. per ml., the relative degree of resistance in both cases was not less than twelve times that of the control. A sensitivity test with a wider range than that provided by the standard Dubos method for the estimation of high degrees of streptomycin resistance is therefore necessary in such circumstances.

Fig. 3—Vertical diffusion method of estimating streptomycin resistance. A single large resistant colony of the strain H37RV is growing on a Löwenstein-Jensen slope at the base of which is a solution containing 100 μg. of streptomycin per ml.

Crofton and Mitchison (1948), by testing different colonies from the same culture from a case under treatment, have shown that there may be different degrees of resistance present. It is therefore essential to make the inoculum for any test truly representative by drawing the loop over a wide area of the primary culture, and we have adopted the precaution of emulsifying the specimen so obtained very thoroughly by an hour's slow mechanical shaking in a bottle with glass beads. But, even if the sampling is satisfactory, the method only gives an over-all picture of the sensitiveness or resistance of the patient's strain at the time of the test and no indication of its future state. It could not, for instance, discriminate between a large number of moderately resistant bacilli partially inhibited and multiplying slowly and a few highly resistant bacilli totally uninhibited and multiplying rapidly.

Holt and Cruickshank (1949) described a simpler and quicker sensitivity test for routine use in which cultures on slopes of Löwenstein-Jensen medium are compared with parallel cultures on the same medium in which 2–5 μg. per ml. of streptomycin has been incorporated. The streptomycin can be added either by mixing with the medium before its solidification, with allowance for loss of potency on heating, or by allowing the solidified slope to absorb streptomycin solution uniformly over its surface while lying horizontally. Any culture which grows on plain medium but not on the streptomycin-containing medium is regarded as sensitive. Although a few late colonies may appear on the treated slopes these can be disregarded. A method using slopes, such as this one, reduces the risk, inseparable from the use of liquid media, that resistant bacilli which may have been comparatively scanty in the inoculum will multiply to dominate the final result.

"VERTICAL DIFFUSION" STREPTOMYCIN SENSITIVITY TEST

One of us (J. E. T.) also had experimented with cultures on solid medium, using a method involving diffusion of streptomycin from the base of a Löwenstein-Jensen slope. This "vertical diffusion method" is simple to use and gives not only a broad indication of sensitivity but also an indication of the number of resistant variants, which may have a considerable bearing on the degree of present and future resistance to streptomycin. Since it seems particularly applicable to the type of case recorded in this paper the method is described in detail.

ESTIMATION OF STREPTOMYCIN SENSITIVITY OF VARIOUS STRAINS OF *Myco. tuberculosis* BY VERTICAL DIFFUSION METHOD

Strain	Dubos method (μg. per ml.)	Vertical diffusion method				
		Zones of inhibition with streptomycin in cm. at 4 weeks to nearest 1/4 cm. (averages)			No. of colonies in zones of inhibition at 6 weeks	
		1 μg. per ml.	10 μg. per ml.	100 μg. per ml.	10 μg. per ml.	100 μg. per ml.
No. 1	1/2	1·75	3·25	Complete inhibition	0 & 1	0 & 0
No. 2	1/4	1·5	3	,,	0 & 1	0 & 1
No. 3	1/4	1·5	2·75	,,	1 & 1	0 & 0
No. 4	1/2	1	2·5	,,	1 & 2	0 & 1
H37 RV	1/2	1·25	2·75	,,	0 & 3	0 & 1
No. 5	2	0·5	2·25	,,	6 & 9	1 & 3
No. 6	>6	Nil	1·5	,,	Uncountable	55
No. 7	>6	Nil	Nil	Nil	,,	Uncountable

The tests were performed in duplicate on all strains except 6 and 7, which were from the present case, and thus two readings were obtained of the number of resistant colonies.

Method.—6 ml. amounts of Löwenstein-Jensen medium are poured into 1 oz. screw-capped vials and solidified as slopes in the usual manner. Any condensation water is decanted, and 1 ml. of streptomycin solution is then added to the bottles at the base of the slope in three strengths—1, 10, and 100 μg. per ml. Such concentrations cover the range attainable by clinical dosage. The vials are then labelled and kept refrigerated until required.

For each test the specimen is concentrated—e.g., by Petroff's alkali or Jungmann's acid-iron-peroxide method—and loaded standard loopfuls are inoculated by stroking the entire slope of plain Löwenstein-Jensen medium and the streptomycin-containing media, the "1" and "10" strengths being essential in all cases, and the "100" concentration repaying inclusion, especially in cases of increasing resistance in the course of treatment. Similar cultures of the strain H37RV are also made as controls. The bottles are incubated in the upright position.

After three or four weeks' incubation at 37°C confluent growths are seen on the control slopes, whereas the bottles containing streptomycin show zones of complete inhibition extending from the foot of the bottle and varying in extent with the dose of streptomycin and the sensitivity of the organism. Thus in an average case of sensitivity 1 μg. per ml. may cause inhibition on about a third of the slope, 10 μg. per ml. on about two-thirds, and 100 μg. per ml. on the whole

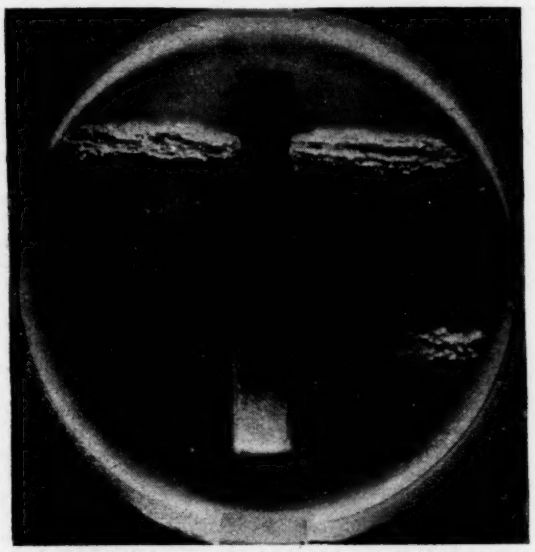

Fig. 4—Löwenstein-Jensen plate with gutter containing 100 μg. per ml. solution of streptomycin. This shows the high degree of streptomycin resistance of strain 7 of *Myco. tuberculosis* from the case described compared with that of a sensitive control (H37RV). Growth of control culture (above) is restricted to one edge of plate, whereas resistant strain (below) is growing uninhibited up to margins of gutter.

of it. From the fourth week onwards, however, a very few minute isolated colonies begin to appear in the zone of inhibition, irregular in distribution but most numerous at the upper margin. The number of such colonies of streptomycin-resistant variants tends to be small and fairly constant (see table). Fig. 3 shows a bottle containing a single large colony of the strain H37RV resistant to 100 μg. per ml. of streptomycin. That they were truly resistant and not due to the streptomycin's losing its potency was proved by testing the residual solution in the bottle for activity.

Streptomycin-antagonist Medium.—Where the patient has already been on streptomycin therapy, culture of the infecting organism is often unsuccessful unless a streptomycin-antagonist is added to the medium. We use Löwenstein-Jensen slopes in which 2 mg. of cysteine hydrochloride per ml. of the medium is added before pouring. During subsequent heating the powerful reducing action of the cysteine may bleach the malachite green with which the medium is coloured; but, when the bottles are stood with their caps screwed down, the dye becomes deeper in colour. When growth has been achieved on the cysteine medium, the organisms are inoculated in the streptomycin-containing bottles for subsequent sensitivity tests. By this method one specimen from a patient who had received streptomycin therapy for nine months was successfully grown after five negative results on the ordinary medium.

Results.—The accompanying table gives the results of the test in several representative strains showing initial sensitivity to streptomycin, and in the strain from our patient which showed initial resistance to streptomycin.

The extraordinarily high degree of resistance of the organisms isolated from our patient both before and after streptomycin therapy contrasts sharply with the degree of resistance shown by all the other strains tested. Strain 6, obtained before the start of streptomycin therapy, was totally uninhibited by 1 μg. but sensitive to 10 μg. of streptomycin after incubation for a month, but with longer incubation resistant colonies became uncountable with 10 μg., and 55 such colonies were present even with 100 μg. In strain 7, obtained after the completion of 3 months' streptomycin therapy, the resistant organisms had multipled to such an extent that confluent growths were obtained at both 10 and 100 μg. as well as at 1 μg. after incubation for a month. It is noteworthy that although the initial streptomycin resistance was so high it was considerably enhanced by three months' streptomycin therapy, just as in the vast majority of cases with little or no initial streptomycin resistance. The intense resistance developed is well shown in the Löwenstein-Jensen plate (fig. 4). Strain 7 and the control strain (H37RV) were stroked on the medium at right angles to a gutter containing a solution of streptomycin in a concentration of 100 μg. per ml. The plate was then sealed and incubated at 37°C for two months. The growth of the control culture was restricted to one edge of the plate, while the resistant specimen grew uninhibited up to the margin of the gutter on both sides.

DISCUSSION

It is unfortunate that most streptomycin-sensitive organisms tend to become increasingly resistant to streptomycin when exposed to it; some strains show this tendency to a much greater degree than others. During the long course of treatment of tuberculous patients streptomycin resistance develops slowly and can seldom be demonstrated in the first month. Thereafter widely differing rates of development have been reported, but all are agreed that there is a rapid increase in resistance in the second month of streptomycin therapy. Several workers have shown that streptomycin resistance is very uncommon before the start of streptomycin therapy. Blattberg and Ehrhorn (1949) tested the streptomycin resistance of tubercle bacilli obtained from 39 patients before, during, and after treatment with streptomycin 1 g. daily for 90–180 days. Before the start of treatment none of the 32 strains tested was resistant to 2·5 μg. of streptomycin per ml. After 30 days' treatment no resistant strains were found. After 60 days 13% had resistant bacilli, after 90 days 29%, and after 100–120 days 45%. The proportion of resistant bacilli increased after cessation of treatment in 4 cases. Nevertheless, Pyle (1947) and others have shown that tubercle bacilli isolated from patients before the institution of streptomycin therapy do not have a uniform susceptibility to the bacteriostatic action of streptomycin. Youmans and Williston (1948) found that streptomycin-resistant variants were obtained from 43½% of 57 strains of tubercle bacilli isolated before the inception of streptomycin therapy, and they believe that the isolation of streptomycin-resistant variants before the beginning of, or early in the course of, therapy indicates the probability of development of resistant strains, and thus the prognosis.

The development of streptomycin-resistant strains in the community which has recently been observed is probably caused, in the vast majority of cases, by infection from patients who have received streptomycin therapy and in whom the surviving tubercle bacilli have developed streptomycin resistance. Thus, the proportion of streptomycin-resistant tubercle bacilli in the community will be likely to increase in proportion to the greater use of streptomycin. This accommodation of susceptible organisms to antibiotics by the development of resistant strains is a feature of antibiotic therapy in general, the increasing prevalence of penicillin-resistant *Staph. aureus* being a notable example.

The likelihood that cases of tuberculosis which show initial resistance to streptomycin will become increasingly prevalent emphasises the need for routine sensitivity tests. To be of value the results of any sensitivity test should be available before, or at least at an early stage in, streptomycin treatment; and the ideal plan would be to test the diagnostic cultures of cases on entry to hospitals or sanatoria, and to record the findings for reference. The vertical diffusion method described here offers a simple and rapid test suitable for routine use in small laboratories, and by indicating resistant variants as well as the general level of sensitivity it may suggest the probable response to streptomycin. It is particularly suitable for the type of case which we have described, because it reveals the full extent of the initial resistance

and the hopelessness of even massive therapy which might succeed in a border-line case.

We believe the case recorded here is of particular interest and rarity, because the streptomycin resistance observed before the start of streptomycin therapy must almost certainly have been a primary resistance and not the more common acquired resistance produced in the infecting strain by streptomycin therapy. In May, 1948, when this infant was infected, streptomycin had not become available for general hospital use in Scotland, the meagre supply being still allotted to research units. It therefore seems extremely unlikely that infection could have been contracted from anyone harbouring tubercle bacilli rendered streptomycin-resistant by streptomycin therapy. It is unfortunate that no tubercle bacilli were isolated from the infant's mother, who was the probable source of infection, since it would have been of great interest to compare the streptomycin resistance of her infecting organisms with that of the organisms isolated from her infant.

SUMMARY

A case of miliary tuberculosis in a young infant yielded cultures of *Myco. tuberculosis* showing a high degree of primary resistance to streptomycin. The probable source of infection was the mother and neither mother nor baby had previously received any streptomycin.

Resistant variant bacilli are usually very scanty in cultures made before the start of streptomycin treatment, but in the present case they were numerous.

A simple vertical diffusion streptomycin-sensitivity test is described which demonstrates higher degrees of streptomycin resistance than does the standard Dubos test, and also indicates the number of resistant variants present.

The prognostic value of a streptomycin-sensitivity test on organisms isolated before the inception of streptomycin therapy is emphasised, and a plea is made for the routine performance of a simple initial test such as the vertical diffusion test described.

For the bacteriology of this paper grateful acknowledgment is made to Prof. T. J. Mackie for his constant encouragement and advice and to Dr. J. P. Duguid for his suggestions.

REFERENCES

Blattberg, B., Ehrhorn, H. (1949) *J. Lab. clin. Med.* **34**, 358.
Crofton, J., Mitchison, D. A. (1948) *Brit. med. J.* ii, 1009.
Cruickshank, R. (1950) see *Lancet*, i, 366.
Holt, H. D., Cruickshank, R. (1949) *Mon. Bull. Min. Hlth*, **8**, 103.
Medical Research Council (1948) *Lancet*, ii, 862.
Pyle, M. M. (1947) *Proc. Mayo Clin.* **22**, 465.
Youmans, G. P., Williston, E. H. (1948) *Proc. Soc. exp. Biol., N.Y.* **68**, 458.

THROMBOTIC "HYDROCEPHALUS" IN INSULIN THERAPY

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THROMBOSIS of the cerebral veins and sinuses has long been recognised and extensively reported. Gowers (1893) classified it into primary and secondary types according to the absence or presence of local septic lesions. The primary type, though comparatively rare, occurs in a wide range of diseases: associated most often with the extremes of life, it occurs in marasmic and cachectic conditions, in protracted debilitating illnesses, in tuberculosis and typhoid, in conditions giving rise to increased concentration and increased coagulability of the blood (as in dehydration due to persistent diarrhœa), in blood disorders (such as leukæmia and chlorosis), and with low blood-pressure; and it may present as part of the clinical picture in thrombophlebitis migrans. The secondary type is associated with septic conditions of the face, scalp, and nasopharynx, and of the paranasal and mastoid air sinuses.

In the past decade attention has been directed to primary cerebral thrombosis by its increasing recognition as a complication of pregnancy and the puerperium (Symonds 1931, 1937, Martin, 1941, Martin and Sheehan 1941, Stansfield 1942, Kendall 1948). Kendall reviewed the literature on cerebral vascular catastrophes in this connection since Ménière's paper in 1828.

Symonds (1931) suggested the name otitic hydrocephalus for the syndrome of increased intracranial pressure, with a cerebrospinal fluid (C.S.F.) of normal composition, caused by thrombosis of the superior longitudinal (sagittal) sinus arising as a complication of otitis media. McAlpine (1937) proposed toxic hydrocephalus as a more inclusive title, since the identical picture was caused by infection in the nasal passages; he described five cases in which a "cold" appeared to play a significant ætiological rôle.

The term hydrocephalus usually implies a gross excess of C.S.F. either within the ventricles or in the subarachnoid space. Though the symptoms of thrombotic "hydrocephalus" are similar to those of hydrocephalus, it is doubtful if there is a great excess of C.S.F. Two sets of findings point to this conclusion: (1) where either ventriculography or encephalography has been done, as in some of McAlpine's (1937) cases and in two of those reported here, neither dilatation of the ventricles nor an undue amount of supracortical air was demonstrated; and (2) the striking relief of the symptoms, and the reduction of pressure to within normal limits by the removal of small amounts of C.S.F.—in none of the present cases was more than 30 ml. removed at any one puncture. However, since there probably is an excess of C.S.F. sufficient to cause the increase in pressure within the theca, and since this arises as a sequel to thrombosis of the venous sinuses, the title thrombotic "hydrocephalus" is ætiologically accurate and clinically descriptive.

We describe here three cases of thrombotic "hydrocephalus" occurring as complications of insulin therapy, in which several factors may favour thrombosis.

FIRST CASE

Mrs. A., aged 42, was admitted on Oct. 18, 1948, with ideas of persecution, and a recent history of auditory hallucinations. She was evasive in her answers but in a clear state of consciousness.

Insulin treatment began on Nov. 17, and on 100 units of insulin she passed into her first coma on Nov. 23; almost immediately she had a major epileptiform convulsion. After immediate interruption with glucose by tube feed she regained consciousness with no residual signs. On Dec. 14 she had a secondary hypoglycæmia but rapidly recovered on taking glucose by mouth. On Dec. 15 and 18 recovery from coma was slower than usual. On Dec. 22—the 18th coma—she developed laryngeal spasm, with cyanosis, and breathing afterwards was depressed. Nikethamide and oxygen were administered. Recovery of consciousness was slow in spite of intravenous glucose, and she was drowsy for the rest of the day. Her temperature at 6 P.M. was 100·8°F, pulse-rate 84, and respirations 22. Next day she appeared fairly well, but treatment was not resumed until Dec. 28. On Dec. 29 she complained vaguely of numbness of face, hands, and legs; her speech was slower than normal for her. On Jan. 1 she appeared to have slight spastic dysarthria, but no objective signs were found. Treatment was suspended, but in spite of symptoms of numbness and stiffness of the left side of her face, and numbness of both hands and of the right leg and foot, no sensory or motor impairment was found on Jan. 9. Treatment was therefore continued next day. On Jan. 12 she vomited her nasal feed and recovered slowly after intravenous glucose. She seemed to have a little difficulty with her speech. Though she remained active, pleasant, and sociable, there was little improvement in her psychotic symptoms, and it was therefore decided to try combined insulin and E.C.T.

Electroconvulsive Therapy.—Electric convulsions were induced during the 32nd, 33rd, and 34th comas (Jan. 22, 24, and 25). On Jan. 26 she was more lethargic; she answered questions normally, but her speech was more dysarthric, and her gait rather stumbling; and when she was asked to maintain her arms outstretched with her eyes closed, her right arm moved downwards and outwards. She was disoriented for time, saying the date was Oct. 22. Over the next two days she became more drowsy; she could be aroused to answer questions, but was irritable. No papilloedema was found.

Lumbar puncture on Jan. 28 produced clear C.S.F. under a pressure of 180 mm. 20 ml. of C.S.F. was removed, containing 1 polymorph, protein 20 mg. per 100 ml., chloride 760 mg. per 100 ml. Lange and Wassermann reactions were both negative. Within an hour the patient began to improve, being less drowsy and answering questions quite brightly. On Jan. 29 she continued to improve; but on Feb. 3 she started to become drowsy again, and by Feb. 7 she was in the same state as on Jan. 28. Lumbar puncture produced clear C.S.F. under a pressure of 300 mm. and unchanged in composition.

Examination of the blood showed red cells 3,540,000 per c.mm., white cells 9000 per c.mm., Hb 66 per 100 ml., colour-index 0·94. The differential white-cell count was normal.

Progress.—Over the next month she exhibited the same picture—i.e., increasing drowsiness, irritability, and disorientation, which was relieved temporarily by lumbar puncture. The C.S.F. was always normal, there was a normal Queckenstedt response, and the physical signs were limited to facial weakness, dysarthria, slight differences in the arms, and slight stiffness in gait. The plantar responses were flexor throughout. The C.S.F. pressure gradually fell: on Feb. 17 it was 270 mm.; on March 1 260 mm.; on March 23 200 mm.; and on April 12 130 mm. Radiography of the skull showed no abnormality.

Electro-encephalography.—Dr. C. C. Evans, of Belmont Hospital, on Feb. 25 reported as follows: "Alpha rhythm is about 8 cycles per second and tends to be unstable. Slower frequencies, mainly in the theta range but sometimes in the delta range, are seen throughout the record in all areas but have maximal amplitude in the parietal areas. The abnormality is observed more in the transverse electrode position than in the anteroposterior. There is no significant asymmetry. There is a paroxysmal tendency. This record does not suggest a cortical lesion but rather a midline deep-seated disturbance; but the E.E.G. can throw no light on the possible pathology."

Ventriculography (E. J. R. S.) showed that there was no dilatation, asymmetry, or displacement of the ventricular system.

Follow-up.—The only residual physical symptom is the numbness of the face and hands. She has complete amnesia for the period from 1943 until the end of March, 1949, when the increased pressure was disappearing.

Thrombosis of the superior longitudinal sinus was diagnosed on increasing drowsiness, increased intracranial pressure with a normal C.S.F., gradual recovery with repeated lumbar puncture, and a normal ventriculogram. The thrombosis was probably due to intimal damage either from the effects of insulin, or from the increased intravenous pressure produced by the spontaneous fit on Nov. 23, or from the laryngeal spasm and subsequent severe cyanosis on Dec. 22. Dehydration must be considered an important factor, because throughout insulin treatment the patient lost much fluid by sweating.

The first symptoms and signs appeared on Dec. 29—thirty-six days after the spontaneous fit and seven days after the laryngeal spasm—but they did not increase until the induction of electric convulsions on Jan. 22–25, after which they increased rapidly. Moreover, the C.S.F. pressure was 180 mm. on Jan. 28 and 300 mm. on Feb. 7. Probably the early symptoms were due to thrombosis in the cerebral veins but the electric convulsions led to extension of the clot to the sinus or initiated a new thrombus in that vessel, obstructing the absorption of C.S.F. The pressure returned to normal in 70–80 days.

The residual lesions are those which first appeared, suggesting that thrombosis of the veins led to permanent damage of the cortex.

SECOND CASE

Miss B., aged 26, was admitted on April 4, 1949, with schizophrenia.

Treatment.—On April 11, 15, and 19 three electric convulsions were induced, and on April 21 insulin treatment, starting with 20 units, was begun. On April 22 and 25 E.C.T. was given in the evening, the patient having recovered eight or nine hours earlier from the insulin administered in the morning. On April 29 she had the first insulin coma on 140 units during the seventh treatment. On the morning of May 6 she did not pass into coma on 220 units, and in the evening she was given a further electric convulsion, during which a deep cyanosis developed, but she recovered normally. On May 7 insulin 240 units was injected, and the patient was very restless until at 9.30 A.M., in the stage of sopor, she had a strong spontaneous epileptiform convulsion. The hypoglycæmia was immediately interrupted, and she had fully regained consciousness by 9.50 A.M. At noon she felt very well. At 4 P.M. she complained of an intense headache, especially in the frontal region, felt dizzy, was unsteady on standing, and became drowsy. There was slight papilloedema of both discs, and the retinal veins were engorged, more on the right than on the left. There was gross peripheral defect in the fields of vision, more on the right than on the left. The pupils were moderately dilated and reacted sluggishly and with small excursion to light and accommodation. No diplopia, nystagmus, or paresis of the ocular muscles; no other cranial-nerve defect observed. Tendon-reflexes on the right side, in both arm and leg, were exaggerated compared with the left; abdominal reflexes were absent; and the sense of passive movement in the great toe was defective on the left side.

Lumbar puncture produced clear C.S.F.; pressure 280 mm. Pressure on the left jugular vein produced a rapid rise in the manometer reading, but pressure on the right vein caused scarcely any rise. Pressure was slowly relieved to within normal limits; examination of the fluid next morning showed protein 20 mg., glucose 72 mg., and chloride 730 mg. per 100 ml.

Progress.—After removal of the fluid the patient rapidly improved and the headache was relieved, persisting longest at the vertex. Her drowsiness disappeared with the headache. Her temperature was 98°F and pulse-rate 80. On May 8 she was free from headache in the morning. Blurring of the discs, variable abdominal reflexes, and tendon-reflexes exaggerated on the right compared with the left were found. During the afternoon the headache began to return, and she was unsteady on her feet.

Lumbar Puncture.—On lumbar puncture on May 8 the level of the C.S.F. rose abnormally slowly to 90 mm. and showed good fluctuation with coughing. Compression of the right jugular vein produced no rise, but compression of the left produced an extremely slow rise to 150 mm., with a very slow fall on relaxation. The C.S.F. contained protein 30 mg., chloride 735 mg., and glucose 70 mg. per 100 ml. On May 9 there was no change in the clinical condition. Lumbar puncture yielded clear C.S.F. under a pressure of 230 mm. A Queckenstedt test gave a normal response on the left and an equal but much slower rise on the right. The fluid showed no cells, protein 20 mg., chloride 710 mg., and glucose 70 mg. per 100 ml.

Progress.—On May 11 she complained of severe headache and a rushing noise in the head and ears. On May 12 she appeared more stuporose, had difficulty in comprehension, and complained of headache and of throbbing in the ears. Papilloedema and altered reflexes were found as before, but there was also diminished hearing on the right side, with impairment of air and bone conduction. No signs of inflammation were found in either ear.

Lumbar Puncture.—On May 12 the manometer reading rose very slowly, taking over a minute to reach 80 mm. Pressure on alternate jugular veins produced no change in the level, but bilateral compression yielded a slow rise to 150 mm. and an equally slow fall on relaxation. Coughing produced a sharp rise and fall. The C.S.F. contained a fair number of red cells, one lymphocyte, and protein 50 mg. per 100 ml. These unusual findings from the Queckenstedt test were attributed to a block probably at the foramen magnum, and the increased amount of protein in the C.S.F.

seemed to support this view. Further, for the two days following the puncture the pulse-rate, normally about 80, fell to 60.

Progress.—With the administration of 25% magnesium-sulphate enemas the noises in the ears gradually disappeared and the headache and mental symptoms diminished. During the next week the improvement was maintained and the headache decreased, but the papillœdema persisted.

Electro-encephalography.—On May 17 Dr. C. C. Evans reported a mild non-specific abnormality throughout the record. There is no evidence of a focal lesion. This would suggest that the lesion, if present, is deep and centrally situated rather than near the surface of either hemisphere.

Lumbar puncture on May 21 yielded clear C.S.F. under a pressure of 140 mm., with only a slight difference between the Queckenstedt responses. The C.S.F. was normal, with protein 25 mg.

Ophthalmoscopy (Mr. Maurice Whiting) on May 21 showed slight bilateral papillœdema, but the swelling was not above the retinal level.

Encephalography by Dr. F. Reitman at Netherne Hospital on June 9 showed a normal ventricular system; no dilatation or distortion, and no undue amount of supracortical air.

Follow-up.—The patient's condition appears to be stationary. The papillœdema has almost disappeared, her tendon-reflexes are exaggerated on the right, and slight diminution in the peripheral field of vision of the right eye persists. Mentally there is no significant change.

Venous-sinus thrombosis was diagnosed on the epileptiform convulsion, followed within a few hours by severe headache, increased intracranial pressure associated with normal C.S.F., papillœdema persisting for some weeks, and altered tendon-reflexes. The diagnosis of a cerebral tumour was excluded by the subsequent course of the illness.

It is thought that a partial block occurred at the foramen magnum, the temporary increase in protein and fall in pulse-rate to 60 apparently justifying this supposition. The increased C.S.F. pressure suggests that the superior longitudinal sinus was involved. The pressure returned to normal limits within three or four weeks.

THIRD CASE

Mrs. C., aged 28, was admitted on Oct. 13, 1948, with schizophrenia. She was mute and negativistic at times, and preoccupied with auditory hallucinations.

Treatment.—Between Jan. 7 and Jan. 24 6 convulsions were electrically induced, and insulin treatment was begun on Jan. 28. The first coma, on Feb. 5, occurred on 160 units during the 8th treatment. Three days later, after fifteen minutes of her 3rd coma, the patient had a spontaneous epileptiform convulsion. Coma was interrupted with glucose by nasal tube and she was fully awake at 12.15 P.M., appearing physically normal. Insulin therapy was continued with no unusual features until her 34th coma on March 23, when she vomited the entire nasal feed. Next day extreme restlessness was a feature of the coma, and intravenous interruption was necessary. On the evening of March 25 she complained of not feeling well and treatment was interrupted. On the 26th she seemed to have a limp of the left leg.

As she did not improve mentally treatment was started again on April 6. E.C.T. was given during coma, producing a major fit. This was repeated on April 7, but only a tonic spasm developed. Insulin alone was continued until April 18, when an electric convulsion was again induced during coma. Combined shocks on April 19 and 20 produced only tonic spasms. No more treatment was given.

Progress.—At first she was very restless, but over the next ten days she gradually became more withdrawn, lethargic, and ultimately stuporose. On May 2 a lumbar puncture was attempted; but, though the theca was entered, the needle was withdrawn because of the patient's struggles. She had bilateral extensor plantar responses. On May 3 she was more rational than at any time since admission, but she was amnesic for at least her stay in hospital. She was slightly dysarthric and walked with a limp, swinging the left leg.

Lumbar puncture yielded clear C.S.F. under a pressure of 240 mm. A Queckenstedt test was indefinite. 20 ml. of C.S.F. was removed. "Cells: one lymphocyte, occasional red cells. Protein 30 mg. per 100 ml., no excess of globulin; chloride 760 mg.; glucose 65 mg."

Central Nervous System.—On May 4 the patient had blurring of the nasal margin of left disc, with engorgement of the right retinal veins; but, apart from the dysarthria, no abnormality of the cranial nerves was observed. Hoffmann's signs were present in both arms, and the tendon-jerks on the left were much exaggerated. In the legs the knee and ankle jerks on both sides were extremely brisk, the left more so than the right, and both plantar reflexes were extensor. She was less amnesic and less disoriented.

Progress.—On May 6 she complained of a strained feeling over the frontal region; there was papillœdema of both discs; the reflexes were still very brisk, especially on the left; the left plantar response was definitely extensor and the right was doubtful. Lumbar puncture produced clear C.S.F. under a pressure of 160 mm. On May 7 the limp had disappeared, and she was less coöperative; the papillœdema was less, but the other signs were unchanged. On May 9 lumbar puncture produced normal C.S.F. under a pressure of 120 mm. Queckenstedt test normal.

Electro-encephalography (Dr. Evans) on May 17 showed "a bilateral generalised abnormality which is non-specific and of moderate degree. Groups of slow frequency, mainly of the theta range, are seen throughout the record. This suggests that the lesion, if present, is probably deep and centrally situated, rather than near the surface of either hemisphere. Patient not very coöperative, and no further localisation is possible."

Progress.—On May 20 the papillœdema had subsided, and the reflexes in the arms were not so exaggerated, but the left continued greater than the right, while in the legs the reflexes were still very brisk, the left more marked than the right; the left plantar response was extensor and the right doubtful. The patient still complained of the strained feeling in the frontal area.

Ophthalmoscopy (Mr. Whiting) on May 25 showed temporal pallor on the right and some slight optic atrophy on the left.

Follow-up.—The patient is amnesic for her stay in hospital but can remember everything from the time she "came round" after puncture on May 2. She is rational and active but shows no inclination to think about the future. Her leg-reflexes are exaggerated, and the left plantar response remains extensor.

Thrombosis of the superior longitudinal sinus was diagnosed on increased intracranial pressure with a normal C.S.F., papillœdema, weakness in both legs, and bilateral plantar extensor responses. The initial neurological signs—limp and headache—suggest that the initial lesion was in a superior cerebral vein and spread later to the superior longitudinal sinus.

FACTORS PREDISPOSING TO THROMBOSIS

Anatomy

There are usually eight superior cerebral veins draining into the inferolateral aspect of the superior longitudinal sinus on each side (O'Connell 1934). An anterior group passes upwards and slightly backwards, but a posterior group passes upwards and forwards, making the direction of flow partly against that in the sinus. There is therefore in the posterior veins a tendency to stasis, which is accentuated when the patient lies a long time supine, or when the pressure within the sinus is increased. Both these factors occur in the puerperium and in insulin therapy.

Increased Intravenous Pressure

Batson (1940) showed that blood from the pelvis and the legs may, when the intra-abdominal and intra-thoracic pressure is raised, pass by the vertebral veins to the intracranial sinuses. The vertebral veins, as they ascend, form a plexus which communicates not only with all segmental areas of the body but also with the basilar, sigmoid, and occipital sinuses (Brash and Jamieson 1943). Increased pressure within the abdomen and thorax, combined with the muscular contractions which take place in parturition and in epileptiform fits, will cause both decreased outflow from the cranium, owing to the rise in pressure in the jugular veins, and redirection of the venous return, greatly augmented by

the muscular contractions, to the cranial sinuses. This may well overdistend the thin-walled cerebral veins and thereby tear their endothelium (Kendall 1948).

Changes in Blood-vessel Walls

At several necropsies after Sakel's insulin treatment changes in the blood-vessels have been found, mostly in the arteries but sometimes in the veins and capillaries. Though in most cases all the coats of the blood-vessels have been affected, the greatest damage has fallen on the endothelium (Ferraro and Jervis 1939a and b, Kastein 1938, Gralnick 1941), as shown by proliferation of the intimal cells, which are swollen and show changes in the cytoplasm and nuclei.

Thrombosis secondary to these changes has often been noted; it may affect veins of all sizes, and Kastein (1938) described a case of thrombosis of the superior longitudinal sinus.

Other evidence of changes in the vascular walls includes ischæmic degeneration of the glomerular arterioles and capillaries (MacKeith and Meyer 1939), small hæmorrhages by diapedesis through the vessel walls, and alteration in the permeability of the blood-C.S.F. barrier (Kingsley and Freed 1941). It is therefore suggested that, as a result of alterations in nutrition, the intimal cells undergo changes, usually reversible, which may either in themselves lead to thrombosis or, in the presence of increased intravenous pressure, render the wall more susceptible to small tears.

Changes in Blood

The injection of insulin is given at 7 A.M., and hypoglycæmia proceeds until the coma is interrupted, usually three or four hours later. During this time many patients lose much fluid through profuse sweating and excessive salivation. Dehydration and therefore concentration of the blood (Whitby and Britton 1946), especially of the cells and proteins (including fibrinogen), are likely to result. Since 30–50 treatments are administered, the patient is exposed for a considerable time to these factors.

FORMATION AND SITE OF THROMBUS

The thrombus may take a long time to become large enough to cause symptoms or clinical signs. In the puerperal cases the symptoms have come on 4–137 days after parturition (Stansfield 1942). The intervals between the spontaneous hypoglycæmic convulsion and the onset of symptoms in the present three cases were 36 days, about 6 hours, and 45 days.

The formation of the thrombus is supposed to start with a small lesion of the intima, which may be a change caused in the endothelial cells by insulin (as described above), a tear due to a rise in pressure in the superior longitudinal sinus (as postulated by Kendall 1948), or a combination of both. Platelets, fibrin, and leucocytes are next deposited, forming a nucleus—a grey thrombus—on which other blood elements are laid at different rates. If a vein is affected, the blood-flow through it is slowed, eventually the lumen is occluded, perhaps suddenly, and a red thrombus is formed. The process may then extend towards and involve the superior longitudinal sinus. Various types of thrombus in the sinus have been described: multiple small mural clots (Symonds 1937); a layer of clot lining the wall without occluding the lumen (Gowers 1893); a long thrombus attached to the wall only at one end (Martin and Sheehan 1941); a thrombus occluding the lumen of the sinus but present only in the anterior or the posterior portion of the vessel (Martin 1941); or a clot filling the whole sinus.

An aseptic clot soon becomes organised and canalised, with the re-establishment of the venous pathway, but the time taken depends on the type and size of thrombus. The symptoms will be relieved in this way or by the development of a collateral circulation.

PRODUCTION OF HYDROCEPHALUS

Excess of C.S.F. may be caused by either increased formation or decreased absorption.

The superior longitudinal sinus is triangular in cross-section, with the apex below. The superior cerebral veins enter the lower part of the sinus. At its superolateral angle the sinus communicates with the lacunæ laterales, into which project arachnoid villi, from which C.S.F. passes by osmosis into the lacunæ. Therefore thrombosis along the superolateral angle of the sinus will block the entrances of the lacunæ and raise the pressure of the C.S.F. Canalisation of the clot will restore the connection between the lacunæ and the sinus. Before this happens the removal of excess C.S.F. by lumbar puncture cures the hydrocephalus.

Thrombosis in the lower part of the sinus, if at all extensive, is likely to block the openings of the cerebral veins and so raise the intracranial tension. Then, unless an adequate collateral circulation develops, residual permanent damage due to cortical softening is likely to ensue in spite of repeated lumbar puncture.

Experimental attempts to produce hydrocephalus by thrombosis of the longitudinal sinus in young dogs (Beck 1944) have met with little success, but in a few cases fullness of the retinal veins developed. In dogs, however, the venous circulation is different and the collateral vessels can apparently cope easily with the blockage. Presumably in man, unless a large proportion of the villi are obstructed, those that remain not obstructed may be able to compensate for the disturbance.

SIGNS AND SYMPTOMS

Focal Signs

Thrombosis of a cerebral vein gives rise to local signs which depend on the part affected. Unless other channels dilate to drain the area, softening of the cortex may ensue, with permanent damage. In insulin therapy, as in the puerperal cases, various symptoms have been reported: paræsthesiæ, monoparesis and hemiparesis, dysarthria, aphasia, and amaurosis, most of which clear rapidly (Spencer 1948). In three personal cases, including the present case 1, the patients complained of persistent numbness of the face and of the fingers of one or both hands. Read et al. (1939) reported a case of hemiplegia following insulin therapy which cleared up leaving a permanent left Hoffmann sign, left facial paresis, and exaggerated reflexes. Though many of these symptoms and signs are due to the hypoglycæmia, some of them, especially those persisting for a considerable time after interruption of therapy, are no doubt due to vascular disorders.

Epileptiform fits are a common but not invariable accompaniment of venous thrombosis, often occurring as presenting signs. Martin (1941) suggests that if the superior longitudinal sinus is occluded before the vein, convulsions are less likely, owing to the opening up of the collateral circulation; or alternatively that the absence of convulsions may be due to the gradual onset of the obstruction.

In insulin treatment major epileptiform convulsions are not uncommon in the early stages—i.e., within 100 minutes of the injections. Focal lesions following shortly after these are rare, and the fits must be attributed to the effects of hypoglycæmia. We suggest that these convulsions may initiate the thrombosis by producing small lesions in the endothelium of the veins or the sinus.

Signs of Increased Intracranial Pressure

Headache is considered to be very constant and early (Kendall 1948) and may be generalised or localised. In the present three cases frontal and vertical headache was intense in one, one patient complained of a "strained feeling" in the head, and the third did not complain (though she may have had a headache). Papillœdema

may or may not be present: in one of the present cases it was absent, and in the other two it was slight or moderate.

The mental state varies also. Many patients are alert in spite of severe papilloedema, &c., but all stages of impairment, from lethargy through drowsiness to stupor and coma, have been reported. In psychotics the mental picture may be confusing. Vomiting is often absent.

Cerebrospinal Fluid

A marked and protracted increase in pressure of C.S.F. almost certainly indicates thrombosis in the superior longitudinal sinus. The composition of the C.S.F. is normal, and there is no increase in the amount of protein or in the white-cell count; if bleeding has occurred red cells may be found.

DIAGNOSIS

Sinus thrombosis is unlikely to be confused with many conditions. Cerebral hæmorrhage and embolism have a more dramatic onset, and a cause for embolism can often be found. Subarachnoid hæmorrhage and meningitis can be excluded on the C.S.F. findings. Cerebral tumour presents the main difficulty and ventriculography may be necessary.

Thrombosis of the lateral sinus occurs most commonly with infection in the middle ear, and extension to the longitudinal sinus is relatively uncommon. The Queckenstedt test applied to diagnose occlusion of the lateral sinus is unreliable (Woodhall 1936). In thrombosis of the longitudinal sinus even less reliance can be placed on it, owing to the extensive collateral circulation (O'Connell 1934). In the present series there was a normal finding in case 1, no significant differences in case 3, and in case 2 the responses varied greatly as recorded above.

TREATMENT

Since a clot obstructing the entrance to the lacunæ laterales may become organised, with re-establishment of a lumen, repeated lumbar puncture, to remove the unabsorbed fluid and to relieve the pressure until this is achieved, is the rational method of treatment. The speed with which the headache and the drowsiness were eased by lumbar puncture was remarkable in two of the three cases, but the effects were temporary. As the days pass, the height of the pressure falls gradually to normal.

In all thrombotic conditions the use of anticoagulants is now recommended to prevent further spread; none of these patients were so treated, but nevertheless all made a good recovery.

Where cases present with repeated fits sedation is strongly indicated, especially since each convulsion would worsen the condition. Although each of these patients had a spontaneous convulsion during hypoglycæmia, none has shown a tendency to epilepsy since the conclusion of treatment, in spite of the absence of anticonvulsant therapy.

Little can be done, or indeed appears necessary, for residual symptoms due to local venous thrombosis. Recovery, if it takes place, proceeds uneventfully.

PROGNOSIS

Most cases of primary venous thrombosis of the dural sinuses are associated with other diseases which are themselves often fatal. The mortality-rate in the puerperal cases, which appear the most closely related to those reported here, has been calculated by Kendall (1948) to be about 30%, but he considers that wider recognition of the thrombosis will lower this figure considerably. We have been unable to trace any published records of thrombotic "hydrocephalus" complicating insulin treatment of psychotics diagnosed during life, but the necropsy reports do indicate that the condition may have passed unrecognised, and we suggest that among the deaths attributed in the past to "hypoglycæmic encephalopathy" may have been some due to thrombotic "hydrocephalus."

Residual effects due to damage of the cortex may persist, but recovery, when it takes place, seems generally to be complete. Numbness of the face and hand, slight differences in reflexes, and slight optic atrophy, none of which inconvenience the patient, have remained as permanent effects in one or other of the present cases.

DISCUSSION

In these three cases the thrombosis was associated with epileptiform convulsions, spontaneous and induced. The combination of electric convulsions and insulin is a well-recognised therapy that may produce results where either alone is ineffective (Sandison and McGregor 1942, Barahona Fernandes and Polonio 1946, Freudenberg 1947, Sargant 1947).

In a case described by Kastein (1938), thrombosis of the superior longitudinal sinus was discovered at necropsy after a course of insulin therapy in which the patient had an epileptic fit. In his case and in ours, convulsions, spontaneous or induced, developed during the course of hypoglycæmic treatment. The intervals between the spontaneous fits and the onset of clinical manifestations varied but made it likely that in two cases at least the convulsions were an ætiological factor rather than an indication of the thrombosis.

Though we emphasise the importance of the fits we do not suggest that the convulsions alone are responsible for the thrombosis. Electric convulsions are a routine treatment in mental disorders, yet neurological lesions are rare, and such as have been reported are attributed to hæmorrhage or to embolism. We therefore postulate that in insulin therapy there are produced conditions eminently conducive to thrombosis: (1) the endothelium of the blood-vessels suffers changes which alone may be sufficient to initiate thrombosis but which will in any case render the venous intima more liable to damage from overdistension during a convulsion; (2) the hypoglycæmia may induce a fit and thus increase the intravenous pressure; and (3), if a lesion has developed, stasis and hæmoconcentration will favour the development of thrombosis.

The occurrence of three cases within so short a period suggests that the combination of electric convulsions and insulin renders the patient more liable to thrombosis of the cerebral veins and sinuses, and reinforces the conclusion that the fits, however caused, are of ætiological significance.

SUMMARY

Thrombotic "hydrocephalus" is suggested as the name for the clinical syndrome arising from thrombosis of the superior longitudinal venous sinus. Three cases of this syndrome arising as a complication of insulin therapy are described.

Factors predisposing to venous thrombosis are examined, and the site and formation of the venous thrombus are discussed. The production of "hydrocephalus" by thrombosis of the longitudinal sinus is examined with particular reference to anatomical and experimental findings.

The symptoms of thrombosis of the superior longitudinal sinus are briefly presented, and the differential diagnosis, with particular attention to Queckenstedt's test, is discussed.

The suggestion is made that convulsions are of ætiological importance, particularly when associated with the changes produced by insulin therapy.

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References at foot of next column

PULMONARY FIBROSIS FOLLOWING GRANULOPENIA

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WE report here two cases of severe postirradiation bone-marrow depression complicated by bronchopneumonia which showed, post mortem, considerable organisation.

Case 1.—A man, aged 59, was admitted on Jan. 13, 1949, with six months' history of a generalised painless enlargement of superficial lymph-glands. No other abnormality was found. A blood-count on Jan. 14 showed Hb 102%, white cells 6900 per c.mm. (neutrophils 71%, lymphocytes 22%, monocytes 6%, eosinophils 1%).

Biopsy of an axillary gland showed a giant follicular lymphoblastosis with areas of rapid growth suggesting lymphosarcomatous change.

X-ray therapy was begun on Feb. 15, a strip field technique being used, and was completed on March 8, 1949. White-cell counts showed 2100 cells per c.mm. on March 9 and 900 per c.mm. on March 14. The patient exhibited no notable symptoms or signs of this considerable leucopenia, and unfortunately a differential count was not done then.

March 16: the total white-cell count was still only 1000 cells per c.mm., and the patient developed pyrexia for the first time, his temperature rising to 104°F the following day and never falling entirely to normal before he died. Treatment with penicillin 100,000 units four-hourly was begun on March 16, when he had a purpuric rash in the skin, more marked at points of pressure and tending to occur especially at sites of injection. Examination of his chest revealed no abnormal physical signs, but a chest radiogram on March 23 showed consolidation in the left upper and right mid zones. The following day the purpura had increased and the patient had severe epistaxis. A blood-count on March 24 showed Hb 63%, white cells 2300 per c.mm. (neutrophils 74%, lymphocytes 18%, monocytes 7%, eosinophils 1%), and platelets 6000 per c.mm. The clotting-time was 4 minutes, and bleeding-time longer than 15 minutes. The patient was transfused with two pints of fresh blood, and his general condition improved, hæmoglobin rising to 80%, but the pyrexia continued although the dosage of penicillin was increased on March 25 to 250,000 units four-hourly, and streptomycin 0·5 g. was given four-hourly.

March 28: a blood-count showed Hb 68%, white cells 2000 per c.mm. (neutrophils 58%, lymphocytes 40%, monocytes 2%), and platelets 510,000 per c.mm. On this day there were gross signs of consolidation in the left upper zone of the chest anteriorly and in the right mid zone posteriorly. Radiography showed no change in the last five days.

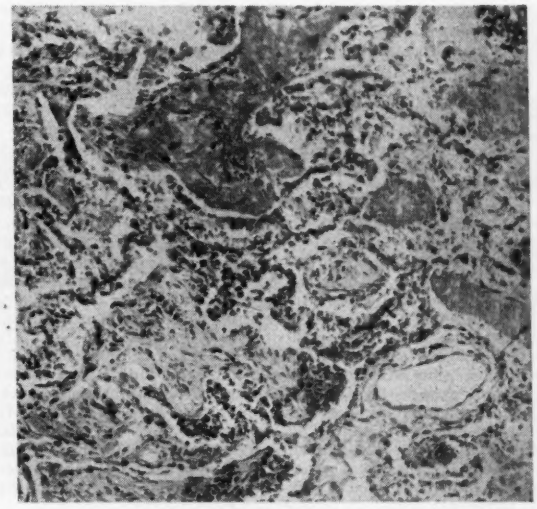
March 29: the sputum gave a profuse growth of coagulase-positive *Staph. aureus* and α hæmolytic streptococci.

On March 31 the patient was transfused with a further two pints of fresh blood when his general condition was deteriorating rapidly.

April 4: the purpura had again increased, and signs of heart-failure had appeared, the physical signs of consolidation in his lungs remaining the same.

April 6: the patient died, the total white-cell count having fallen to 840 per c.mm. twenty-four days after the known onset of his granulopenia.

Necropsy.—The body was that of a well-developed elderly man with numerous petechial hæmorrhages scattered over the skin surface. Internally, enlarged mediastinal lymph-glands up to 1 in. in diameter were all that remained of the previous generalised glandular enlargement. Only the changes in the lungs, with which we are particularly concerned, will be mentioned here. Each pleural space contained about a pint of amber fluid, with thickening of the pleural surfaces. There was widespread, almost confluent, consolidation of both lungs, sparing only parts of the lower lobes. On section the upper lobes resembled lobar pneumonia in its later stages, except that the cut surface was rather moister. Many portions of the lung sank in water.



Section of lung from case 1, showing advanced organisation of fibrinous exudate in alveoli (× 85).

Histology.—The great majority of the alveoli contained exudate in the process of organisation, only occasional dilated air-containing alveoli being present (see figure). Recognisable fibrin, often hyaline, occupied some of the air sacs, though most were filled by young fibrous tissue. No bacteria were seen and only very occasional polymorphs. Moderate numbers of mononuclear cells, often with large and irregular nuclei, were present. Diagnosis: fibrosis of lungs, follicular lymphoblastosis.

Case 2.—A girl, aged 18, had attended the radiotherapy department of Bristol Royal Hospital on Sept. 30, 1948, with three months' history of a swelling of the left side of the neck, followed by a sore throat and the appearance of a small gland in the left supraclavicular fossa. At that time she had been found to have a mass of enlarged matted glands in the left side of the neck from the mastoid process down to the sternoclavicular angle. Biopsy had shown lymph-gland with extreme lymphoid hyperplasia and loss of normal architectural pattern consistent with lymphosarcoma or lymphatic leukæmia. X-ray treatment had been given to the neck from Oct. 4 to Oct. 15, 1948, total dosage of 1500 r to both sides of the neck. Six weeks later the glands had recurred, and a chest radiogram had shown a left pleural effusion. Radiotherapy to neck and left axilla had been started again on Feb. 1, 1949, and treatment completed seven days later. The patient had then come to London and been admitted to the Middlesex Hospital on May 2, 1949.

On admission she complained of cough and dyspnœa on exertion, and examination revealed a generalised superficial

DR. DONNELLY, MR. RADLEY-SMITH: REFERENCES

Barahona Fernandes, Polonio, P. (1946) *J. ment. Sci.* **92**, 794.
Batson, O. V. (1940) *Ann. Surg.* **112**, 138.
Beck, D. K. (1944) *Proc. R. Soc. Med.* **37**, 388.
Brash, J. C., Jamieson, E. B. (1943) Cunningham's Textbook of Anatomy. London; p. 1304.
Ferraro, A., Jervis, G. A. (1939a) *Amer. J. Psychiat.* **96**, 103.
— — (1939b) *Psychiat. Quart.* **13**, 207.
Freudenberg, R. K. (1947) *J. ment. Sci.* **93**, 9.
Gowers, W. R. (1893) A Manual of Diseases of the Nervous System. London; vol. II, p. 451.
Gralnick, A. (1941) *Amer. J. Ophthal.* **24**, 1174.
Kastein, G. W. (1938) *Z. ges. Neurol. Psychiat.* **163**, 322, 342.
Kendall, D. (1948) *Brain*, **71**, 386.
Kingsley, G. R., Freed, H. (1941) *Arch. Neurol. Psychiat.* **45**, 289.
McAlpine, D. (1937) *Brain*, **60** 180.
MacKeith, S. A., Meyer, A. (1939) *J. ment. Sci.* **85**, 96.
Martin, J. P. (1941) *Brit. med. J.* ii, 537.
— Sheehan, H. L. (1941) *Ibid.*, i, 349.
Ménière, P. (1828) *Arch. gén. Méd.* **16**, 489.
O'Connell, J. E. A. (1934) *Brain*, **57**, 484.
Read, C. F., Heilbrunn, G., Liebert, E. (1939) *J. nerv. ment. Dis.* **90**, 747.
Sandison, R. A., McGregor, J. S. (1942) *J. ment. Sci.* **88**, 387.
Sargant, W. (1947) *Ibid.* **93**, 22.
Spencer, A. M. (1948) *Ibid.*, **94**, 513.
Stansfeld, F. R. (1942) *Brit. med. J.* i, 436.
Symonds, C. P. (1931) *Brain*, **54**, 55.
— (1937) *Ibid.*, **60**, 531.
Whitby, L. E. H., Britton, C. J. C. (1946) Disorders of the Blood. 5th ed., London: p. 50.
Woodhall, B. (1936) *Arch. Surg.* **33**, 297.

painless lymphadenopathy and signs of a left pleural effusion. A blood-count showed Hb 100%, white cells 3600 per c.mm. (neutrophils 32%, lymphocytes 45%, monocytes 3%).

X-ray treatment was suspended after only six days because the white-cell count fell rapidly, but it was begun again on May 16, 1949.

May 20: the sternal marrow showed extensive infiltration with lymphocytes (which constituted 94% of the total nucleated-cell count of 196,000 per c.mm.) which had taken the place of the normal marrow tissue. These findings strongly suggested lymphatic leukæmia or lymphosarcoma. X-ray treatment was continued, and the lymphadenopathy subsided rapidly, the patient's general condition being satisfactory, with a white-cell count of 5000–8000 per c.mm.

July 13: a pustule appeared on the right cheek, from which coagulase-positive *Staph. aureus* insensitive to penicillin and sensitive to streptomycin was isolated. Radiotherapy was again withheld.

July 15: the patient's temperature rose to 105°F with the maturation of the skin lesion, and a blood-count showed Hb 57%, white cells 2000 per c.mm. (neutrophils 1%), and platelets 50,000 per c.mm. The patient was transfused with one pint of fresh blood. Treatment with penicillin 50,000 units four-hourly had been begun on July 13, and, when the granulopenia was found by this blood-count, the dosage was increased to 500,000 units four-hourly, and streptomycin 0·5 g. six-hourly was given in addition.

July 17: radiography showed the pleural effusion to remain the same, and there were rounded opacities in the right second and third intercostal spaces.

July 19: spontaneous bruising beneath the left clavicle and a small petechial hæmorrhage on the back were found. At the right lung base were many coarse râles and a loud pleural rub. The patient became progressively more ill, jaundiced, and died on July 23, 1949.

Necropsy.—The body was that of an intensely pale and slightly jaundiced girl, with numerous petechial hæmorrhages over the front of the chest, and enlarged glands visible in the neck. Internally, the lymph-glands of the neck, mediastinum, and abdomen were all enlarged up to 1 in. in diameter, and there was some enlargement of the liver and spleen. The left pleural space contained about 3 pints of bloodstained fluid, rather less on the right. The left lung was collapsed from pressure of the effusion, and its pleural covering was thickened and contained numerous small hæmorrhages. The right lung was firm as if consolidated, though slightly nodular on palpation, and its pleura was thickened, roughened, and in one or two places adherent to the chest wall. On section the lung resembled a lobar pneumonia in the stage of red hepatisation, though moister and less uniform.

Histology.—Some alveoli were packed with red cells, others were filled with a fibrin network or albuminous fluid, and in others the fibrin was being invaded by young fibroblasts. Occasional large clumps of bacteria buried in fibrin were seen, especially in the exudate covering the pleural surface. Only very rarely were polymorphs seen, but many large mononuclear cells were present, and in places the alveolar lining cells were enlarged to form a conspicuous layer. Towards the periphery of the lung were some normally aerated alveoli. Most of the bronchioles had lost their epithelial linings and contained fibrin and mucus. Diagnosis: lymphatic leukæmia, post irradiation granulopenia, and confluent hæmorrhagic bronchopneumonia, with early organisation.

DISCUSSION

References to the lung changes in granulopenia are scanty. Those we have consulted report commonly a hæmorrhagic bronchopneumonia with or without necrosis of the lung (Rotter 1925, Schaefer 1926, Hueber 1930). Some workers have found a pulmonary œdema (Morgan and Detweiler 1939, Tragerman and Goto 1939), and only infrequently has any chronic inflammation been noted. Baltzer (1926) states that in one of his cases there was hypertrophy of connective tissue and of alveolar epithelium. In the pneumonia of granulopenia an intra-alveolar fibrin network has been described by Empey and Proescher (1932) and Schwager (1938). The patients in these cases, reported before the general use of antibiotics in the therapy of granulopenia, survived generally less than ten days.

We regard the lung changes seen post mortem in both our cases as examples of almost confluent bronchopneumonia as modified by granulopenia and antibiotics. The presence of bacteria and polymorphs usually indicates the inflammatory origin of a fibrinous exudate. Although few were seen in the lungs of our cases, all the features being taken into account, there was no danger of confusion with certain non-inflammatory conditions in which a fibrinous exudate enters the lung alveoli, such as uræmic pneumonia (Doniach 1947). In this condition a passive transudate associated with heart-failure is unusually rich in fibrinogen, a result possibly of the action of uræmic blood on the vessel walls, and masses of fibrin, subsequently organised to fibrous tissue, fill the alveoli. Although this condition has been called uræmic "pneumonia," the absence of inflammation is an essential feature.

The polymorphs are generally believed to play a major part in the resorption of fibrin in the process of resolution. In our cases the fibrosis of the lungs can reasonably be attributed to the granulopenia.

Thrombocytopenia may have contributed to the hæmorrhage into the lung alveoli but was of relatively short duration. The term "agranulocytosis" has been purposely avoided here because it implies the complete absence of circulating polymorphs and is rare in its fully developed form. It seems that the resorption of fibrin can be interfered with by a reduction of granulocytes to the levels seen in these cases and short of complete agranulocytosis.

In the past, agranulocytosis or severe granulopenia has usually been fatal within a short time. With recent advances in chemotherapy we can expect to see more patients with associated bronchopneumonia surviving long enough for organisation to occur in the lungs, and for fibrosis of the lung to be recognised as a serious complication of granulopenic pneumonias.

We wish to thank Prof. B. W. Windeyer, Prof. A. Kekwick, and Dr. A. Willcox for permission to publish notes of these cases, and Prof. R. W. Scarff for his help and advice.

REFERENCES

Baltzer, H. (1926) *Virchows Arch.* **262**, 681.
Doniach, I. (1947) *Amer. J. Roentgenol.* **58**, 620.
Empey, L. W., Proescher, F. (1932) *Amer. J. Dis. Child.* **43**, 947.
Hueber, W. (1930) *Frankfurt. Z. Path.* **40**, 312.
Morgan, J. R. E., Detweiler, H. K. (1939) *J. Lab. clin. Med.* **25**, 275.
Rotter, W. (1925) *Virchows Arch.* **258**, 17.
Schaefer, R. (1926) *Disch. Arch. klin. Med.* **151**, 191.
Schwager, C. (1938) *Zbl. allg. Path. path. Anat.* **70**, 323.
Tragerman, L. J., Goto, J. M. (1939) *J. Lab. clin. Med.* **25**, 1163.

PREVENTION OF HÆMOLYSIS DURING FREEZING AND THAWING OF RED BLOOD-CELLS

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FROZEN and freeze-dried serum and plasma can be used therapeutically after storage for many months or even years.[4 5 17 20] By contrast, whole blood or separated blood-cells can be stored in vitro only at temperatures between + 2°C and + 8°C and for no longer than 4 weeks before transfusion.[1 8 9 17 19 20] So far no method satisfactory for use on a large scale has been described for preventing the hæmolysis which occurs during freezing and thawing. Thus, Luyet's technique[10] of freezing thin films of blood at — 196°C, or Strumia's method[16] necessitating rigid temperature control of the frozen blood at — 3°C, are mainly of academic interest, while the cells which survived freezing and thawing in the experiments of Griffits et al.[6] had increased fragility.

The purpose of this communication is to report the action of glycerol in preventing hæmolysis due to freezing

and thawing. Glycerol preserves the motility of spermatozoa[12–14] subjected to low temperatures. It has also been used in experiments on the preservation of viruses[11 15] and sarcoma cells.[2 3] With red blood corpuscles glycerol in low concentrations (3% approx.) has often been used as a hæmolytic agent.[7] It was surprising, therefore, to find that in heparinised guineapig blood or rabbit blood mixed with equal volumes of semen diluents composed of buffered glucose-saline solutions containing 10%, 20%, or 30% of glycerol, the corpuscles appeared microscopically unaltered in shape and size after a few minutes and after 1 hour at room-temperature. The samples were then frozen at — 79°C, and 1 hour later thawed at + 40°C. The tubes containing final concentrations of 5% glycerol showed considerable hæmolysis, whereas with 10% and 15% glycerol there was little hæmolysis and the corpuscles were neither crenated nor obviously swollen.

A series of experiments was then carried out with samples of heparinised rabbit blood diluted with equal quantities of mixtures of glycerol in Ringer's solution, and glycerol in 0·85% NaCl. The results showed that with final concentrations of 10% or 15% glycerol the blood could be stored for 7 days at + 2°C without appreciable hæmolysis. After freezing quickly to, and storage at, — 79°C for 5 minutes, 1 hour, 18 hours, 3 days, 4 weeks, 6 weeks, and 3 months, and subsequent thawing at + 40°C, most of the red blood corpuscles survived and were unaltered in shape. The results with 5% or 20% glycerol were less satisfactory. Control samples diluted with Ringer's solution or 0·85% NaCl showed almost complete hæmolysis on thawing. After cooling glycerol-treated blood to — 79°C slowly during 30 minutes or 1 hour, the red cells were slightly less well preserved.

The process of hæmolysis during freezing and thawing of blood without glycerol, and its prevention in the presence of glycerol have been studied under the microscope,[15] and were illustrated in a film shown during a symposium on the Freezing and Drying of Animal Cells, held at the National Institute for Medical Research in June.

In these preliminary experiments only one specimen of human blood was tested. 0·5 ml. samples were diluted with equal volumes of 30% glycerol in Ringer, to give a final concentration of 15% glycerol, and then frozen at — 79°C. When thawed after 2 hours, 24 hours, 1 week, 2 weeks, and 8 weeks, the red cells appeared little altered microscopically, and on centrifuging the colour of the supernatant fluid indicated only a slight degree of hæmolysis. It remains to extend the in-vitro work on human material and to investigate the behaviour of red cells so stored when reintroduced into the blood-stream.

REFERENCES

1. Cohn, E. J. (1949) in Preservation of the Formed Elements and of the Proteins of Blood. American Red Cross.
2. Craigie, J. (1949) *Brit. J. Cancer*, **3**, 268.
3. — (1949) *Brit. med. J.* ii, 1485.
4. Greaves, R. I. N. (1946) *Spec. Rep. Ser. med. Res. Coun., Lond.*, no. 258.
5. — (1949) in G. Keynes's Blood Transfusion. Bristol; section IX.
6. Griffits, J. J., Hornibrook, J. W., Downs, J. J. (1949) in Preservation of the Formed Elements of the Proteins of Blood. American Red Cross.
7. Jacobs, M. H., Glassmann, H. N., Parpart, A. K. (1950) *J. exp. Zool.* **113**, 277.
8. Loutit, J. F., Mollison, P. L., Young, I. M. (1943) *Quart. J. exp. Physiol.* **32**, 183.
9. — (1945) *J. Path. Bact.* **57**, 325.
10. Luyet, B. J. (1949) in Preservation of the Formed Elements and of the Proteins of the Blood. American Red Cross.
11. Melnick, J. L. (1948) *Proc. 4th int. Cong. trop. Med. Malaria.* Washington: U.S. Dept. of State Publ. 3246; vol. I, p. 403.
12. Polge, C., Smith, A. U., Parkes, A. S. (1949) *Nature, Lond.* **164**, 666.
13. Smith, A. U., Polge, C. (1950) *Ibid*, **166**, 668.
14. — — (1950) *Vet. Rec.* **62**, 115.
15. — — Smiles, J. (in the press).

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Medical Societies

ROYAL SOCIETY OF MEDICINE

Pneumonia

PNEUMONIA was discussed at a meeting, on Dec. 15, of the section of epidemiology and State medicine of the Royal Society of Medicine.

Dr. W. H. BRADLEY, president of the section, pointed out that during the past thirty years both notifications and deaths had decreased; the death-rate had begun to fall even before 1938, when chemotherapy was introduced.

Dr. J. G. SCADDING discussed the classification of pneumonia in the light of knowledge concerning ætiology. He distinguished first the various aspiration pneumonias, including hypostatic, terminal, and postoperative conditions, and then subdivided the broad group of acute specific pneumonias according to their several ætiological agents. The bacterial pneumonias due to pneumococci, hæmolytic streptococci, staphylococci, Friedländer's bacillus, and the tubercle bacillus, each had distinctive clinical features. The virus pneumonias could be subdivided into: (1) those where bacteria were also concerned, as influenza and measles; and (2) those due to viruses alone, including psittacosis, ornithosis, and other unidentified pneumotropic agents. Pneumonias due to rickettsiæ, such as Q fever, and to fungal and plasmodial causes were much less common.

Dr. Scadding thought that aspiration pneumonias, which might occur in bronchitic subjects or after an acute upper-respiratory infection, were often confused with virus pneumonias. The main characters of virus pneumonias were: prominent constitutional, rather than respiratory, symptoms; lack of response to penicillin; normal leucocyte-count; and a radiographic opacity whose distribution was neither segmental nor lobar. The cold-agglutinin titre might be high. At Hammersmith Hospital, London, during the winter of 1949–50, ætiological agents were sought in 110 cases of pneumonia. In 46 cases no pathogenic agent was found, though mouse inoculation of sputum was not practised at first. Pneumococci were identified in 29 cases, staphylococci in 10, and the tubercle bacillus in 4. Serological evidence of influenza B was found in 11 cases, and high titres of cold agglutinins in 10. Of the 27 cases in which agents could not be identified even before chemotherapy was begun, 18 had segmental or lobular changes, 10 being in bronchitic subjects and 4 following an upper respiratory-tract infection.

Prof. C. H. STUART-HARRIS described investigations carried out in Sheffield in the winters of 1947–48 and 1948–49 which were designed to clarify the relation between influenza and pneumonia. Epidemiologically these two winters were different; in the first there was no influenza epidemic, whereas between February and April, 1949, there was a sharp outbreak of influenza A. In the first year 85 cases of pneumonia or bronchitis were investigated bacteriologically and for evidence of influenza virus; and in the second period, between January and April, 1949, 95 cases were similarly studied. The age-distribution in the two series was similar except that there were more subjects over the age of 65 in the second (influenzal) period, and during this time the number of females studied was also higher.

Only 2 sporadic cases of influenza A were detected in the first year, but during the epidemic period 30

DR. SMITH: REFERENCES—*continued*.

16. Strumia, M. (1949) *Science*, **110**, 398.
17. Tovey, G. H. (1950) *Practitioner*, **164**, 171.
18. Turner, T. B. (1938) *J. exp. Med.* **67**, 61.
19. Whitby, L. (1949) in Keynes's Blood Transfusion.
20. White, C. S., Weinstein, J. J. (1947) Blood Derivatives and Substitutes. Baltimore.

strains of virus A were recovered, and positive serological results were numerous. Of 17 fatal cases of pneumonia, 9 yielded virus and 6 staphylococci as well. Of the 53 non-fatal cases of pneumonia investigated during the epidemic, 11 showed rises of influenzal antibody during their progress, and another 9 had on admission high titres of antibody indicating recent virus infection. Pneumococci or staphylococci were both recovered from the sputum in the virus-positive cases. Only in the staphylococcal cases did the clinical evidence suggest a synergic virus-bacterial relation. The types of pneumococci concerned did not differ significantly in the two years, but in the whole period 75% of 117 strains fell into types I–VIII. Professor Stuart-Harris referred to the low carrier-rates in normal people for these types except type III; the rate was, however, higher in the immediate environment of cases of pneumonia due to these organisms. He suggested that carriage of pneumococci and preceding non-bacterial respiratory infection were both concerned in the genesis of pneumonia.

Dr. B. P. MARMION described the results of an examination of 690 sera received during 1949–50 at the Central Public Health Laboratory, Colindale, from all over the country, and from cases of pneumonia at the Hammersmith and West Middlesex hospitals. Clinically the cases were grouped as: influenza (112), lobar pneumonia (108), bronchopneumonia (83), atypical pneumonia (322), and pyrexia of unknown origin (P.U.O.) (65). 27 cases of influenza were positive for virus B; and so also were 15 lobar pneumonias and 6 bronchopneumonias, 51 atypical pneumonias, and 8 cases of P.U.O. The influenza-B cases were grouped in time between the end of January and the beginning of May, 1950. Q fever antibodies were found in 23 cases; clinically, 18 of these were atypical pneumonia, 2 influenza, and 3 P.U.O. Serological evidence suggestive of psittacosis was obtained in a few cases in all clinical categories. Cold agglutinins in titres exceeding 1 in 128 and *Streptococcus M G* agglutinins in titres exceeding 1 in 40 were found in 11 cases of bronchopneumonia and in 67 of the atypical cases—a total of 9% of all specimens from cases of pneumonia.

Dr. BRADLEY questioned Dr. Marmion regarding the *Streptococcus M G*, which is a non-hæmolytic streptococcus first recovered from the lung or sputum from cases of atypical pneumonia in the U.S.A. Dr. MARMION said that sera from cases of atypical pneumonia contained both agglutinins and precipitins for the *Streptococcus M G* but would also fix complement in the presence of normal tissue suspensions. Dr. F. O. MACCALLUM pointed out that the *Streptococcus M G* had not been isolated in Great Britain, and also referred to the recent discovery in the U.S.A. of a new antigenic type of influenza virus unrelated to either virus A or B.

Dr. PERCY STOCKS spoke of the statistician's three nightmares: hypertension, heart-disease, and the influenza-pneumonia conglomerate. It had been decided to continue to classify influenza with the group of acute respiratory diseases rather than with the virus diseases.

Dr. STANLEY BANKS drew a parallel between the fall in incidence of the streptococcal diseases and of the pneumonias.

Dr. R. E. SMITH appealed to clinicians to define their cases of pneumonia more carefully and to withhold chemotherapy from the benign cases now seen in adolescents and children; he felt that the severity of pneumonia in this group had greatly lessened even before the introduction of chemotherapy.

The meeting registered approval of the present classification of pneumonia from the standpoint of notification, and disapproval of any change at present to include atypical pneumonia in the notifications.

Reviews of Books

The Diagnosis of Salmonella Types

F. KAUFFMANN, M.D., chief of the International Salmonella Centre, Copenhagen. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1950. Pp. 86. 16*s.* 6*d.*

THIS book is a practical guide to bacteriological methods by which a few experts, principally in Denmark, England, and the U.S.A., have separated a single bacterial genus into 196 species. To the physician it matters little which of these, unless it be *Salmonella typhi*, infects his patient. To the epidemiologist, however, this multiplicity presents ways of tracing infection which have on occasion proved useful, though limited in application by the fact that at one time and place the majority of salmonella infections are due to one or two species. Lastly, to the bacterial geneticist this genus and the serological interrelation of its species offers an almost untouched field.

Those who intend to distinguish the species of salmonella must have this book; but despite the clear and workmanlike exposition we doubt whether the tyro, with no other aid, will get far; for there is an art as well as a science of bacteriology. The "average" bacteriologist will be grateful to Dr. Kauffmann but also glad that he can call on a Salmonella Reference Laboratory to unravel his tangled skeins.

Worth & Chavasse's Squint

(8th ed.) T. KEITH LYLE, C.B.E., M.CHIR., F.R.C.S., surgeon and medical officer in charge, orthoptic department, Westminster branch, Moorfields, Westminster and Central Eye Hospital. London: Baillière, Tindall, & Cox. 1950. Pp. 319. 35*s.*

Worth's classical *Squint*, an easily read statement of fact, went through six editions under the hand of its begetter. The seventh edition was entirely revised by Bernard Chavasse, under whose hand it became much more complicated. Many foundered in their attempts to assimilate its new ideas of the binocular reflexes and their physiological basis, its chapters on comparative anatomy, and the teachings of Sherrington and Pavlov. In this, the eighth edition, Mr. Keith Lyle has given it yet another character. It is still no easy reading, but the reader is rewarded with a new outlook on the ætiology of squint in terms of developmental anomaly. Mr. Lyle places orthoptics in their right position—invaluable in diagnosis, less valuable in treatment. He urges early operation, so that under ideal conditions the squint is corrected before the age at which orthoptics can be used; and makes it clear that long courses of orthoptics divorced from hospital practice—or even associated with it—are a time-consuming anachronism. No ophthalmic surgeon can fail to benefit from reading this book.

Hämolyse und Hämolytische Krankheiten

CONRAD MAIER, Oberarzt der med. izinischen, Universitäts-poliklinik, Zürich. Berne: Huber. 1950. Pp. 316. Sw. fr. 21.80.

THIS volume begins with a chemical and physical description of the red blood-cell and its contents.

Figures are given to show that some hæmolysis proceeds all the time. Normal serum contains 1–10 mg. of hæmoglobin per 100 ml., and in some anæmias not usually classed as hæmolytic this figure may be increased; in pernicious anæmia, for instance, figures up to 45 mg. are recorded, and such patients are thought to respond relatively poorly to specific treatment. Dr. Maier still devotes much space to Barkan's "easily-split-off iron," though the modern view is that this is an artefact. Full details are given of the various tests applied to the study of red cells. Mechanical fragility gets no fewer than 10 pages and lysolecithin resistance 6. A brief but notably complete section on immune bodies that cause hæmolysis is included and a neat figure makes clear the action of incomplete antibodies.

Rather more than half the book is given over to these physiological matters. Then follows an excellent classification of hæmolytic diseases, including some syndromes

not usually recognised in this country as separate entities. The discussion of the diseases listed makes up the rest of the book and it is much less complete than the list itself.

The space given to the various diseases seems to depend on the author's interest rather than on their relative clinical importance. For instance, Marchiafava's nocturnal hæmoglobinuria has 10 pages, and "hämolytische Anämie Typus Loutit" $5^1/_2$; whereas all the conditions due to Rh incompatibility are dismissed in 2 pages, and the discussion of the difficult subject of acquired hæmolytic anæmias is similarly sketchy. There is a good bibliography with proper reference to American and British work up to 1950.

Within its limits this is a sound and succinct discussion of the subject. The physiology and biochemistry is stronger than the clinical section.

Bone and Joint Radiology

E. MARKOVITS, M.D., head of radiologic department, Elizabeth Hospital, Budapest. New York and London: Macmillan. 1949. Pp. 446. £7.

Dr. Markovits, when chief of the principal radiological department in Budapest in happier days, produced two successful synopses of diagnostic radiology. Descriptive terms for radiological appearances are very limited, and certainly in English this branch of medicine cannot be adequately dealt with by the synoptic method. This new volume is a cross between a synopsis and a textbook, and covers the whole field of bone and joint pathology in considerable detail. The presentation in tabular form is very well done. For each disease there is a brief description of the pathology. This is followed by a radiological description which is in a set pattern for all diseases. The major sub-headings describe changes in the form, the outline, and the structure of the bone. Characteristics peculiar to the localisation in a flat or long bone or in the skull are then dealt with in detail. At the end of each section there are numerous differential diagnostic tables and classifications which should be very helpful to the student. The book is liberally illustrated by line drawings and radiographs, but some of the illustrations are not quite up to the standard of the text. The English is excellent, and there is no doubt but that the author has succeeded in presenting clearly and simply a vast amount of knowledge. His book is very expensive, but well worth the money.

Medical Entomology

(2nd ed.) ROBERT MATHESON, Cornell University. New York: Comstock. London: Constable. 1950. Pp. 612. 54s.

Professor Matheson's textbook first appeared in 1932. Each group of insects is allotted one or more chapters, and the relation of the group to human disease is discussed and often summarised in tables. The greater part of the detailed information being concentrated in these tables, the author is left free to write a readable text.

The American origin of the book has influenced the amount of space allotted to different groups: ticks are handsomely treated, and the British reader may think the treatment of houseflies and myiasis over-generous compared with the rather short chapter on their blood-sucking allies. Professor Matheson is perhaps a little inclined to give solemn warnings without making clear exactly why they are necessary. He is sceptical about the efficacy of game destruction as a means of controlling tsetse flies, but does not describe an example of the actual use of the method. Thus his objection that game destruction "does not seem worth while as domestic animals may also serve as reservoirs" is irrelevant to cases in which game destruction has been a preliminary to the reintroduction of domestic animals. In the same way his dismissal of the drugs used in treating trypanosomiasis does not accord with some African experience. His warning that "all the newer insecticides must be used with care" might well have been supported by giving them a chapter of their own.

As a guide to the insects of medical importance this book should be useful to both doctors and entomologists. As an account of what either the insect or the entomologist does in the field it has some notable gaps.

A Pattern for Hospital Care

ELI GINZBERG, PH.D., director of the New York State Hospital Study. New York: Columbia University Press. London: Oxford University Press. 1949. Pp. 368. 36s.

Professor Ginzberg, of the Graduate School of Business of Columbia University, with a staff of social scientists and statisticians, has made a survey of hospital care and finances in New York State. His report covers acute general hospital care, care for patients with tuberculosis, mental illness, and other long-term illnesses, and care for inpatients and outpatients. The earlier detailed part of the book is heavy going for the English reader, who is apt to be unmoved by the problems of New York State; but later the subject matter widens in scope and the chapters on hospital staff appointments, supervision of the standard of medical care, and principles of internal administration are more easily read. The key factor of administration is the quality of management, but Professor Ginzberg points out that in a hospital there are three centres of power, none of which is closely integrated with the other. The board of trustees possesses the formal power, the doctors are the key professional group; but other groups, such as the nurses, may have secured a high degree of autonomy. Hence the importance of the hospital administrator. Yet

> "the Board of Trustees seldom makes a specific delegation of authority to the administrator and, when it does, often fails to support him should he encounter difficulties in dealing with the doctors or nurses. On the other hand, the board frequently interferes with the administrator by interjecting itself into his work."

Professor Ginzberg therefore urges that the salary scale of hospital administrators should be raised so as to interest "a superior type of person in this career." He suggests that the position might be similar to that of the president of an American university.

Atlas der Haut- und Geschlechtskrankheiten

Prof. W. FRIEBOES, late director of the University skin clinic, Berlin; Prof. W. SCHÖNFELD, director of the university skin and V.D. clinics, Heidelberg. Stuttgart: Thieme. 1949. Pp. 266. D.M. 66.

THIS comprehensive atlas of skin and venereal diseases contains well over 400 illustrations, chosen with skill. All the more common diseases are represented by a series of pictures showing their varieties: rare and very rare diseases, including those of the nails, are shown in at least one or two pictures. There are a few omissions, such as erythrasma, poikilodermia, and Paget's disease of the nipple. Over 300 of the illustrations are beautifully reproduced from colour photographs; those of the diseases of the mouth are particularly impressive. Dermatologists and venereologists will find the book valuable for teaching purposes, and general practitioners will welcome it as a work of reference.

Compulsion and Doubt

Vols. I and II. WILHELM STEKEL, M.D. Translator: EMIL GUTHEIL, M.D. London: Peter Nevill. 1950. Pp. 645. 36s.

THIS work displays the exceptionally wide range of Stekel's experience, the intuitive approach, the penetration, the impatient energetic therapy, and the egotism which were responsible for his fame and his isolation. No-one, except Janet, has devoted so much attention to obsessional disorder, and the case-histories which make up a large part of these two volumes afford a vivid picture of its symptoms and psychopathology. Of the treatment they give a less satisfying account, doubtless because Stekel was a therapist who moulded data and methods to fit his artistic idiosyncrasy. This attitude may be responsible for some of the odd statements which appear here, sometimes as obiter dicta, sometimes as emphatic generalisations: thus there is frequent reference to the "poison-complex," which is finally said to be demonstrable in the psychic structure of almost every case of compulsive disorder. The arrangement of the chapters seems haphazard; the translator provides a corrective for this, however, in his preface which resumes Stekel's views systematically. Though

the book is unsatisfying to the critical reader, it is a storehouse of clinical material, and the outcome of much psychotherapeutic practice.

The Liver

Porta Malorum (*The Gateway to Disease*). KASPER BLOND, M.D., late first assistant, Rothschild Hospital, Vienna; DAVID HALER, M.B., hon. consulting pathologist, Westminster Hospital (All Saints Urological Centre). Bristol: John Wright. 1950. Pp. 268. 25*s*.

THE thesis of these authors is that "all abdominal disorders originate from liver damage"—that is, from portal hypertension and the impairment of the detoxicatory function of the liver. We are asked to believe that such diverse conditions as "ulcers of the intestinal tract in stomach, duodenum, jejunum, appendix or gall-bladder are caused by one disorder only—i.e., acute or chronic intoxication of the liver." In case one should feel that the hypothesis is too narrow the authors inform us that "the portal blood may even enter the thyroid plexus through anastomoses with the œsophageal vein, and possibly result in a toxic goitre." A considerable amount of somewhat startling factual information is presented in support of these views, but little real experimental evidence. The book can be warmly recommended to those who enjoy finding the weak points in a novel argument.

Diseases of the Foot

EMIL D. W. HAUSER, M.S., M.D., associate professor of bone and joint surgery, Northwestern University, Chicago. Philadelphia and London: W. B. Saunders. 1950. Pp. 415. 35*s*.

THERE are now a number of orthopædic textbooks dealing with diseases of the foot, notably those of Lake in this country and Lewin in America. Dr. Hauser makes a valuable addition to these, for though his volume adds little that is new it is thorough and systematic, and written with a personal flavour as well as with authority. Some of the author's preferences in treatment are widely shared (e.g., strapping in the treatment of club-foot); others are more controversial, for instance his view that there is some relation between mycosis of the feet and thromboangiitis obliterans. It is pleasant to find operative treatment firmly kept in second place. The clinical photographs and the reproductions of X-ray films are very good.

Über die Petrositis (Vienna: Maudrich. 1950. Pp. 99. D.M. 9).—This is a small monograph in which Prof. Otto Mayer describes a group of cases and discusses them from a clinical and surgical point of view. The approach is that of the otological surgeon, but the subject is one that interests the neurological physician and surgeon as well. The work is largely descriptive.

Amœbiasis (2nd ed. Cairo: Fuad I University Press. 1949. Pp. 44).—Dr. G. P. B. Sobhy deals chiefly with intestinal amœbiasis, though he mentions the important metastatic lesions, such as amœbic infection of the liver. He discusses at some length the clinical manifestations, diagnosis, and treatment, and deals more slightly with the propagation, prophylaxis, and pathology of the disease. Sobhy Bey has had great experience and his views are entitled to respect; nevertheless, in the absence of the data on which they are based, some of his statements are open to question. For example, in discussing pathology he attributes inflammation and leucocytic infiltration to "eruption of the parasites in the submucous coat," whereas other writers suggest that, until secondary infection occurs, there is a notable absence of leucocytic infiltration in intestinal amœbic lesions. Again, his account of the life-cycle of the parasites in relation to the action of drugs upon them seems somewhat confused. He suggests, for instance, that in chronic cases cysts can be made to hatch by giving extract of ox-bile by mouth, so producing diarrhœa, and that the amœbæ can then be attacked with emetine. This view seems to overlook the fact that amœbic cysts arise in the intestine from pre-existing vegetative amœbæ; and that amœbæ appearing with diarrhœa in a patient previously passing cysts are, in fact, amœbæ which have not been able to encyst before being swept from the bowel.

Atlas der Blutkrankheiten (4th ed. Berlin: Urban & Schwarzenburg. 1949. Pp. 256. D.M. 60).—The last edition of this book, by Dr. Karl Schleip and Prof. Albert Alder, was published in 1941 and is not well known in this country. This edition consists mainly of 139 colour plates, all from paintings and admirably clear—sometimes perhaps deceptively clear. The various kinds of cells have a plate each, and the various diseases are represented by whole fields; it is clearly stated whether they are original fields or arranged ones to show the various cell types. The book is divided into two parts, a first section on blood and a second shorter section on bone-marrow. This artificial division, unusual in modern textbooks, is possibly a relic from older editions. The work is comprehensive, and we remain doubtful whether much is gained by including, for example, pictures of the blood in neutrophil leucocytosis, or in pernicious anæmia in remission, or of large red cells in liver cirrhosis. But there are some very fine unusual plates as well, among which pride of place goes to that of peripheral blood from a 5–6 week embryo.

This, then, is a standard textbook, well executed and reflecting the views of the Swiss school. But those whose German is poor need not struggle with the text, since there are equally good, if not better, books in English.

Essentials of Obstetrical and Gynæcological Pathology (2nd ed. London: Henry Kimpton. 1949. Pp. 350. 60*s*.).—This volume, by Dr. R. L. Faulkner and Dr. Marion Douglass, of the Western Reserve Medical School, will inevitably be compared with Novak's classical textbook. Avowedly aimed at a lower level of the hierarchy of the specialty, it gives no references and does not discuss academic points at any length; but it bears the imprint of Novak's school. The short opening chapters on The Surgical Specimen and on Elementary Histology will help the house-officer, and the comparative brevity of accounts of rarer conditions will give him a proper perspective. If the type is a little hard on the eyes, the subject matter is refreshingly free from serious error or omission, and the illustrations are liberal, though many of the photomicrographs lack sharpness of definition. The approach is always clinical, and the book offers plenty of sound instruction to the postgraduate starting on the long climb to a higher degree in gynæcology. In another edition he would probably be grateful for an additional section on the pathology of pregnancy in general, including the toxæmias.

Doctors Courageous (New York: Harper. 1950. Pp. 292. $3.50).—Dr. Edward H. Hume surveys the history of missionary effort by doctors in four directions—in Africa, in India and Pakistan, in the Near and Middle East, and in China. The account, though not based on the first-hand experience which helped to make his *Doctors East and Doctors West* so interesting, is nevertheless written by one who is master of the subject and who can hold the reader's attention in what has to be a highly condensed statement. He makes clear how great is the reward that waits on medical work among the natives and how much has been accomplished by patient and steady persistence. Even the Witch doctors are growing hospital-minded and have acquired stethoscopes to impress their patients that they too have a part in the new order of things.

The Common Diseases of the Skin (4th ed. Edinburgh: Oliver & Boyd. 1949. Pp. 274. 21*s*.).—Dr. G. A. Grant Peterkin has ably concluded the revision of this textbook by the late Dr. R. Cranston Low. It is of a convenient size and eminently practical: even on the subject of starch poultices real working instructions are given. There are plenty of good monochromes, which prove afresh that, for illustrating diseases of the skin, good black-and-white pictures can be better than colour photographs, which are often inaccurate and therefore misleading. However, some faithful colour plates of the rightly famous Edinburgh moulages are included. The condition which has long been classified as acute seborrhœic dermatitis is here taken out of the "seborrhœa" group and is given the provisional name of "flexural infected eczema." "Dermatitis" would have been a better word, for the term "eczema" is now becoming obsolete; but it is to be hoped that others will follow this lead, and include under seborrhœa only seborrhœa capitis, dry scaly seborrhœa corporis, and infantile seborrhœic dermatitis.

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Hepatitis

TILL 1939 infective hepatitis (catarrhal jaundice) aroused comparatively little interest; but during the war the disruption of military plans by epidemics among troops led to investigations throughout the world. Fortunately, this interest has persisted, and after many lean years some progress is being made.

The maximum incidence is in the age-group 5 to 15 years; but in these young people the disease is usually very mild, and jaundice is rare in children under 5. Infection at this age may be symptomless or may cause mild gastro-enteritis, while attendant nurses develop the full-blown disease. Occasionally, however, even in the very young the disease may terminate fatally, either with acute yellow atrophy or after protracted subchronic hepatitis and resulting multiple nodular hyperplasia.[1 2] One of the cases reported by TRAISMAN et al.[2] was thought to be due to transfusion with an icterogenic batch of blood-plasma. So-called homologous-serum hepatitis apparently has a lower attack-rate in children,[3] but undoubtedly the condition does occur. When a group of susceptible children receive injections from an icterogenic pool, the fatality-rate may be high; among 41 cases in a group who received convalescent measles serum there were 8 deaths [4]; and among 7 cases in a similar, more recent, episode there were 3 deaths.[5] It was hoped that these rare incidents would be eliminated by the routine irradiation of serum with ultraviolet light.[6] However, recent reports from the U.S.A. of hepatitis after administration of irradiated plasma [6] confirm warnings by MACCALLUM [7] and NEEFE [8] that this technical procedure needs care. Moreover, the original experiments showing inactivation by ultraviolet light were carried out on only two or three strains of virus. Observations by COCKBURN and his colleagues [5] on the results of inoculating the gamma-globulin fraction of an icterogenic plasma pool confirm the belief that this fraction is relatively non-icterogenic. Among 10 recipients of plasma there were 7 cases of jaundice with 3 deaths; but among 58 recipients of gamma-globulin there was only 1 case, which was mild. Whether the fractionation procedure involved in making gamma-globulin inactivates the icterogenic agent, or merely masks it by concentrating antibody in excess of virus, is unknown. Since 1945 epidemics of infective hepatitis have been uncommon except in the U.S. army of occupation in Germany, where the civilian population is little affected.[9] The reason for this is still obscure; but there seems to be a suggestion that a considerable proportion of these cases are inoculation hepatitis of one kind or another. A further limited source of hazard is infection from handling human sera either in the clinical laboratory or the blood-bank.[10]

In 1945 STOKES and NEEFE [11] reported that gamma-globulin prepared from ordinary adult serum was, as in measles, a useful prophylactic against infective hepatitis in closed or semi-closed communities. This was later confirmed by HAVENS and PAUL.[12] But, once the disease develops, the outcome depends mainly on the patient's own recuperative powers. Most adult patients make a good recovery with no residual damage; but, as we have remarked, acute yellow atrophy occasionally develops in children, and in some adults the acute attack is followed by subchronic or chronic hepatitis and death. Because 'Aureomycin' acts on some viruses, its effect on infective hepatitis was studied in the U.S.A. It was found to have little, if any, influence on the duration or severity of the acute symptoms,[13] but when given to patients with acute hepatic coma or chronic liver disease it seemed beneficial.[14] Aureomycin has also prevented or delayed the onset of hepatic necrosis in rats on a necrogenic yeast diet. This has led GYORGY and his associates [15] to suggest that aureomycin has no specific action on the virus but inactivates the intestinal organisms, thus preventing formation of bacterial metabolites and giving the parenchymal cells a chance to recover from their purely virus lesion.

In the epidemiological field prospects also look brighter. For many years it has been realised that for every patient with obvious catarrhal jaundice there were probably several with a less severe illness without jaundice. Even in cases with jaundice there is no specific immunological test to distinguish infective hepatitis from obstructive or other types of jaundice. Attempts to infect laboratory animals have been unsuccessful, and no satisfactory diagnostic changes could be observed in developing chick embryos inoculated with infective material. However, ESSEN and LEMBKE [16] reported from Germany that they had produced anicteric hepatitis in man by inoculation with egg cultures; and now HENLE and his colleagues [17] have obtained multiplication of two strains of infective-hepatitis virus—one from fæces and one from serum—in cultures of rabbit-liver and chick-embryo tissues and in the amniotic sac of developing chick embryos. When both types of culture, representing a dilution of the original material of from $10^{-10.4}$ to 10^{-20}, were given orally in man, they caused an illness similar to anicteric hepatitis, usually after an incubation period of 20–35 days. Furthermore, intradermal injection of the infected cultures, after treatment with a presumably inactivat-

1. Wyllie, W. G., Edmunds, M. E. *Lancet*, 1949, ii, 553.
2. Traisman, A. S., Wheeler, R. C., Fager, D. B. *J. Pediat.* 1950, **37**, 174.
3. Fox, J. P., Manso, C., Penna, H. A., Pará, M. *Amer. J. Hyg.* 1942, **36**, 68. Lehane, D., Kwantes, C. M. S., Upward, M. G., Thomson, D. R. *Brit. med. J.* 1949, ii, 572.
4. Memorandum by medical officers of the Ministry of Health. *Lancet*, 1943, i, 83.
5. Cockburn, W. C., Harrington, J. A., Zeitlin, R. A., Morris, D., Camps, F. Personal communication.
6. Rosenthal, N., Bassen, F. A., Michael, S. R. *J. Amer. med. Ass.* 1950, **144**, 224. Barnett, R. N., Fox, R. A., Snavely, J. G. *Ibid*, p. 226. James, G., Korns, R. F., Wright, A. W. *Ibid*, p. 228.
7. MacCallum, F. O. *Proc. R. Soc. Med.* 1946, **39**, 655.
8. Neefe, J. R. *Ann. intern. Med.* 1949, **31**, 857.
9. Paul, J. R., Gardner, H. T. *Amer. J. Med.* 1950, **8**, 565.
10. Kuh, C., Ward, W. E. *J. Amer. med. Ass.* 1950, **143**, 631.
11. Stokes, J., Neefe, J. R. *Ibid*, 1945, **128**, 1063.
12. Havens, W. P., Paul, J. R. *Ibid*, p. 270.
13. Shaffer, J. M., Farquhar, J. D., Stokes, J., Sborov, V. M. *Amer. J. med. Sci.* 1950, **220**, 1.
14. Farquhar, J. D., Stokes, J., Whitlock, C. M., Bluemle, L. W., Gambesia, J. M. *Ibid*, p. 166. Shaffer, J. M., Bluemle, L. W., Sborov, V. M., Neefe, J. R. *Ibid*, p. 173.
15. Gyorgy, P., Stokes, J., Smith, W. H., Goldblatt H. *Ibid*, p. 6.
16. Essen, K. W., Lembke, A. *Med. Z.* 1944, **1**, 99.
17. Henle, W., Harris, S., Henle, G., Harris, T. N., Drake, M. E., Mangold, F., Stokes, J. *J. exp. Med.* 1950, **92**, 271.

ing dose of ultraviolet light, gave a positive skin reaction in nearly 100% of patients convalescent from naturally acquired or induced infective hepatitis [18]; normal subjects so far tested have given only about 30% of positives. A similar figure was obtained in cases of homologous-serum hepatitis—a finding which supports the hypothesis that there are at least two immunologically distinct hepatitis viruses. The thymol-turbidity and flocculation tests may not distinguish between serum hepatitis and infective hepatitis in an individual case, but observations by GREEN [19] support the suggestion of MACLAGAN [20] and NEEFE [21] that these tests are less strongly positive in patients with serum jaundice than in those with infective hepatitis. The growth of the virus of infective hepatitis in tissue-cultures is possibly a first step toward adaptation to small laboratory animals and production of large quantities of high-titre material for specific serological tests.

Although MACCALLUM and BAUER [22] reported jaundice in subjects inoculated with tissue-culture of the virus of homologous-serum hepatitis, skin tests with this material gave negative results in a small group convalescent from yellow-fever vaccine (serum) jaundice. Thus there is still no means of detecting donors who may be carrying hepatitis virus in their blood.

Atherosclerosis and Cholesterol

MUCH of the recent work on atherosclerosis has been based on the assumption that the cause lies partly in the diet, and special efforts are being made to identify the particular dietary constituents concerned. Cholesterol has been under suspicion ever since ANITSCHKOW showed that arterial lesions could be induced in rabbits by adding that substance to their food. Cholesterol is a usual constituent of arterial lesions, and the hypercholesteræmia of diabetes mellitus, myxœdema, and the nephrotic syndrome is commonly associated with atherosclerosis. Nevertheless it is not easy to believe that even transient hypercholesteræmia is an essential factor in a disease so common as to be discoverable (GEIRINGER [23] says)in everybody over the age of eight. Perhaps too much attention has been paid to cholesterol, and too little to the other blood lipids. In 97 men who developed severe coronary disease before the age of forty, GERTLER, GARN, and LERMAN [24] found that, though the blood-lipid levels were above those of normal controls, the rise in serum cholesterol was not attended by a commensurate rise in phospholipids. There was thus an increased cholesterol/phospholipid ratio, and the investigators took this to be a factor in atherosclerosis. In support of this idea they cited experiments by LADD, KELLNER, and CORRELL,[25] in which the detergent 'Tween 80' (polyoxyalkylene sorbitan mono-oleate) was administered intravenously to rabbits along with cholesterol. Though the animals developed hypercholesteræmia, greater even than that produced by cholesterol alone, they did not develop atherosclerosis—a finding which LADD and his associates attributed to a concomitant rise in phospholipids induced by the detergent. A similar effect was noted by STEINER [26] in giving choline along with cholesterol: here again hypercholesteræmia was produced but little or no atherosclerosis, the choline having accelerated the synthesis of phospholipids in the liver. There is in fact a growing body of opinion that the development of atherosclerosis is due more to an upset of the lipid balance than to an excess of any one lipid in the blood.

Another suggestion relates to the physical state of the plasma lipids. Most of these circulate as colloidal particles which are too small to be seen microscopically; but in the hyperlipæmias of metabolic origin, and in the alimentary lipæmia which follows a fatty meal, larger particles appear which can be seen with the dark-ground microscope, and MORETON [27] has suggested that these macromolecular aggregates, 'or chylomicrons as they are called, are damaging agents. He believes that they act upon the vessel walls in the same way as do the non-lipid macromolecular substances, such as polyvinyl alcohol and methyl cellulose, with which HUEPER [28] induced arterial lesions in rabbits; so in MORETON's view atherosclerosis is the result of a lifetime's ingestion of many fatty meals. In supporting this, BECKER, MEYER, and NECHELES [29] have shown that the chylomicrons tend to persist unduly in the blood of old people: in young subjects the chylomicron-count rises quickly after a fatty meal and returns to normal within $5^1/_2$ hours, but in older subjects it may remain high for 24 hours; and BECKER and his co-workers think that this sustained alimentary chylomicronæmia is a factor in atherosclerosis. Further support for this hypothesis has lately been obtained by POLLAK,[30] who injected colloidal cholesterol of varying dispersions into the circulation of rabbits and found that coarse suspensions induced arterial lesions more readily than fine ones. It appeared that the large micelles were immediately precipitated on the surface of the arteries and phagocytosed by endothelial cells, so that within thirty seconds of the injections accumulations of them were established in the intima. POLLAK holds that macromicelles of β-globulin-cholesterol and of α-globulin-cholesterol are the most likely damaging agents, and he argues that their excess in the circulation of older people may be due to a decrease in serum-albumin. From this it might be inferred that atherosclerosis results from an upset of the serum-protein equilibrium due to inadequate liver function.

The chylomicron hypothesis is not supported, on the other hand, by an investigation of the blood lipids by the use of the differential ultracentrifuge. With this apparatus, which is capable of exerting forces millions of times that of gravity, molecules in solution are made to undergo sedimentation or flotation, according to their densities, and their rates of migration can be recorded in Svedberg units. GOFMAN et al.[31] have applied this technique to the study of the serum lipids, and in recording their relative flotation (Sf) rates found that they fell into the following

18. Henle, G., Drake, M. E., Henle, W., Stokes, J. *Proc. Soc. exp. Biol., N.Y.* 1950, **73**, 603.
19. Green, P. *Canad. med. Ass. J.* 1950, **63**, 365
20. Maclagan, N. R. *Brit. med. J.* 1944, ii, 363.
21. Neefe, J. R. *Med. Clin. N. Amer.* 1946, **30**, 1407.
22. MacCallum, F. O., Bauer, D. J. *Lancet*, 1944, i, 522.
23. Geiringer, E. *Rev. méd. Liége*, 1950, **5**, 614.
24. Gertler, M. M., Garn, S. M., Lerman, J. *Circulation*, 1950, **2**, 205.
25. Ladd, A. T., Kellner, A., Correll, J. W. *Fed. Proc.* 1949, **8**, 360.
26. Steiner, A. *Arch. Path.* 1948, **45**, 327.
27. Moreton, J. R. *Science*, 1948, **107**, 371.
28. Hueper, W. C. *Arch. Path.* 1945, **39**, 117.
29. Becker, G. H., Meyer, J., Necheles, H. *Science*, 1949, **110**, 529.
30. Pollak, O. J. *Rev. méd. Liége*, 1950, **5**, 619.
31. Gofman, J. W., Jones, H. B., Lindgren, F. T., Lyon, T. P., Elliot, H. A., Strisower, B. *Circulation*, 1950, **2**, 161.

classes: (*a*) those with Sf rates greater than 75, which include the chylomicrons and the fatty molecules of alimentary lipæmia; (*b*) those with Sf values 30–70, which constitute the major fraction of alimentary lipæmia; (*c*) those with values Sf 10–20, whose molecular weight is in the neighbourhood of 3,000,000, and which contain about 30% of cholesterol (it is this group which appears to be specifically related to atherosclerosis); and finally (*d*) those with values Sf 3–8, which are the molecules containing cholesterol, phospholipid, and protein—loosely referred to as the B_1 lipoproteins. A clue to the relation of these different classes of molecules to atherosclerosis is obtained from a study of the blood lipids in rabbits receiving cholesterol. In the rabbit there are molecules of an Sf 10–30 class which usually, but not always, increase after long-continued cholesterol feeding. GOFMAN and his colleagues observed that it was only in cases where these were increased that severe atherosclerosis developed, and they therefore concluded that these molecules were the damaging agents. Proceeding then on the assumption that the Sf 10–20 molecules in man were homologous to the Sf 10–30 in the rabbit, they examined the concentrations of the former in various human diseases in which atherosclerosis is prevalent, including coronary insufficiency, diabetes mellitus, the nephrotic syndrome, hypothyroidism, and hypertension, and in all of these found significant increases. They concluded therefore that the Sf 10–20 molecules—which, be it noted, do not include those of alimentary lipæmia—were the particular ones concerned in the development of atherosclerosis. They noted, however, that the Sf 10–20 concentration in man could be reduced by restricting the intake of fatty foods.

From this tangle of information it might be concluded that diet is the all-important factor in atherosclerosis; but there are also facts that call for a modification of this view. Atherosclerosis occurs spontaneously in chickens, and HORLICK, KATZ, and STAMLER[32] found that it still occurred when most of the fats and cholesterol were removed from the bird's diet. Apparently therefore the endogenous lipids in the chicken suffice to provide for the atherosclerotic process; and probably the same holds for man, which brings us to where we were at the beginning of this review. But it should be noted that HORLICK and his associates found that in the chickens on the low-fat diet the lesions were on the whole less severe; so though exogenous fat may not be a necessary factor in the development of atherosclerosis, it is probably a contributory one. Indeed, by feeding chicks on a high-cholesterol diet STAMLER and KATZ[33] induced hypercholesteræmia, hepatic lipidosis, and a high incidence of atherosclerosis of the aorta.

On all these counts therefore, it might be inferred that the severity of atherosclerosis could be reduced by dietary treatment, or by the administration of lipotropic drugs; and such measures have been widely tried. Though in chicks choline and inositol did not prevent spontaneous atherosclerosis or atherosclerosis induced by cholesterol feeding or stilbœstrol,[34] MORRISON and GONZALES[35] have reported benefit from the administration of choline to patients with coronary disease. On the other hand GERTLER, GARN, and WHITE,[36] noting that both in their coronary-disease cases and their controls the serum cholesterol levels were "startlingly" independent of the amounts of cholesterol ingested, conclude that "there is no advantage to be gained from imposing a low cholesterol diet on patients with coronary-artery disease." Moreover any hopes of decisively changing the outlook for such people can be based only on the assumption that it is the fatty changes themselves that are directly responsible for the fatal consequences in atherosclerosis; and this is doubtful. In coronary atherosclerosis it is not the fatty change which hardens and constricts the vessels, but the fibrous thickenings; and the nature of these thickenings is still in doubt. They have long been regarded as reactive overgrowths of the intima, excited by the presence of fats; but in resurrecting the thrombosis hypothesis of ROKITANSKY, DUGUID[37] has suggested that in reality they are organised mural thrombi. If this is true, the fatty changes can play only a limited part in the process. They may promote the thrombosis, and to eliminate them might reduce the thrombotic tendency; but once thrombosis has begun, the size of the thrombus and the extent to which it interferes with the circulation must depend on factors which govern fibrin formation—and this is a field still incompletely explored. Even if the thrombosis hypothesis is wrong, however, it has still to be remembered that it is not so much the fatty deposits as the fibrous thickenings that interfere with the circulation, and these two changes are not so constant in their relationship as to indicate that they are necessarily interdependent. One sometimes sees coronary thickenings, amounting almost to total occlusion, with little or no fat in them, and it is hard to see how the ingestion of fats could be more than remotely culpable.

Apologia of an Allergist

Dr. JOHN FREEMAN, with his friend the late LEONARD NOON, took part in the earliest experimental investigations of hay-fever, in 1908; and the way was thus opened to him for those studies of "toxic idiopathies" which have occupied the whole of his working career and are now collected in an imposing but most human and attractive record.[38] At that time little of value had been published on hay-fever directly, since BLACKLEY's monograph in 1873, which had recognised the condition as due to individual sensitiveness to grass-pollen in the air. States of specific sensitiveness, resulting from infections or artificial injections, had indeed been described in the interim, and presented analogies whose significance FREEMAN may be rather too ready to discount. RICHET had described in 1902, and named "anaphylaxis," a condition of acquired specific sensitiveness in dogs, following an earlier injection; and THEOBALD SMITH had initiated a much wider study of this phenomenon by his recognition of it in guinea-pigs in 1904. In 1904 also, von PIRQUET, studying such conditions as "serum-sickness" and the accelerated but abortive reaction of the immune subject

32. Horlick, L., Katz, L. N., Stamler, J. *Amer. Heart J.* 1949, **37**, 689.
33. Stamler, J., Katz, L. N. *Circulation*, 1950, **2**, 705.
34. Stamler, J., Bolene, C., Harris, R., Katz, L. N. *Ibid*, pp. 714, 722.
35. Morrison, L. M., Gonzales, W. F. *Proc. Soc. exp. Biol. N.Y.*, 1950, **73**, 37.
36. Gertler, M. M., Garn, S. M., White, D. D. *Circulation*, 1950, **2**, 696.
37. Duguid, J. B. *Lancet*, 1949, ii, 925.
38. Hay Fever: A Key to the Allergic Disorders. By JOHN FREEMAN D.M. London: Heinemann Medical Books. 1950. Pp. 321. 42*s*.

to vaccination, had coined the word "allergy" to describe all conditions of "altered reactions consequent on an infection, or on treatment by some foreign substance"; he obviously, therefore, intended the term to cover immunity in all its manifestations, as well as, or paradoxically including, those in which the response indicated an acquired sensitiveness. To FREEMAN and NOON, however, hay-fever seemed in 1908 to present the opportunity of exploring a phenomenon which had hardly, if at all, been touched by experiment; and the enterprise was made additionally attractive by the prospect of finding means of relief, or better of prophylactic treatment, for an often disabling affliction.

From that beginning FREEMAN, after NOON's early death, found himself following the clues of obvious analogy, which led him to a wider study of specific sensitiveness to the now familiar range of provocative substances (food constituents, epidermal dusts, moulds, drugs, &c.) and of the varieties of reaction produced by contacts with them, according to the organ or tissue affected—urticaria, rhinorrhœa, asthma, and the rest. And following, as he gratefully acknowledges, the example of his teacher Sir ALMROTH WRIGHT, that connoisseur of neologisms, FREEMAN proposed to name these conditions "toxic idiopathies"; the provocative substances were to be "idiotoxins" and the substance in the serum, capable of transmitting the idiopathy to the skin or mucous membrane of a normal subject, an "idioceptor." A purified extract used for diagnosis of an idiopathy was a "pathophane." The nomenclature thus proposed was rational enough, and sufficiently free from theoretical implications; but it did not achieve the general currency which it deserved. "Toxic idiopathy" was, after all, rather a mouthful, and von PIRQUET's "allergy" was available to replace it, though only by a drastic restriction of its original meaning; the derivatives "allergic," "allergen," and "allergical antibody" were ready to hand to complete the range of synonyms. And though "allergy" and "allergic" have suffered a popular debasement in the allusive slang of the music-hall and the cocktail party, they have obtained such a hold in medical usage also that FREEMAN feels bound to employ them, as on the title-page, though not regularly and consistently.

Dr. FREEMAN's book is a very personal document, and it has a very practical character. Every chapter contains records of experiments made by the author, and abundant gleanings from the rich harvest of a lifetime's clinical experience in this special field. The conditions studied being, in the manner of their occurrence and manifestation, peculiar to the human species, there is of necessity a specially intimate relation between experiment and clinical observation in dealing with them. Hay-fever itself, the first of such conditions to be studied in detail, and a central point of interest for the author ever since, stands as the type for the whole group. Though the "allergic," or "idiopathic," factor is emphasised, there are full and enlightening chapters on the influence of trauma in localising the reactions, and on emotions, moods, and tensions in precipitating attacks, or even in rendering manifest and active a condition which was presumably already present in a dormant form. It must be admitted that no satisfactory explanation of such a connection is offered by FREEMAN—or, for that matter, by anybody else. He strongly contests a tendency to explain such conditions as simply neurotic in origin; but the nature of the link between the admitted neurotic factor and the biochemical phenomenon of the allergic sensitiveness seems to be left in obscurity: one would like to have some more evidence about allergic reactions on denervated or decentralised areas. Perhaps, too, he might have given less emphasis to the points of contrast, and have found more of interest in the points of similarity, between the fundamental mechanism of anaphylaxis, as produced experimentally in certain animal species, and the idiopathies which occur, apparently spontaneously, in man. For example, the reasons which lead him to argue that the "idioceptor" is not an antibody of any known kind are just those which led the earlier workers on anaphylaxis in the guinea-pig to conclude that its "anaphylactic antibody" was something quite special; yet probably nobody now seriously doubts that it is after all a precipitin, predominantly fixed to the sensitive cells. Similarly, FREEMAN describes the serum of the prophylactically treated patient as having "a newly acquired characteristic," somehow masking the sensitising capacity of the blood (idioceptor), which is nevertheless still there. The relation between immunity and anaphylaxis, as now generally accepted, might, by analogy, afford a simpler interpretation. And how does he reconcile the suggestion of a completely spontaneous origin of sensitiveness to egg-protein, for example, with the almost complete absence of ambrosia-fever in this country and its prevalence in the U.S.A., where ambrosia is so common a weed?

In general, Dr. FREEMAN's book provides a feast of information, compounded of observations, experiments, and wise and cautious commentary. Essentially it is the scientific autobiography, though not a chronologically consecutive one, of a genuine pioneer; and it has the individual quality that enables an author's friends to fancy that they hear his voice as they read.

Public-health Salaries

NEW minimum salary-scales for doctors in the public-health service were awarded last week by the Industrial Court. The scale for medical officers of health is as follows:

Population up to	*Salary (£)* *Initial*	*Annual increment*
75,000	1450–1650	50 × 4
100,000	1550–1850	50 × 5
150,000	1750–2050	50 × 5
250,000	1950–2250	100 × 2; 50 × 1
400,000	2000–2500	100 × 2; 50 × 1
600,000	2300–2700	100 × 3

Where the population exceeds 600,000 the minimum scale will be followed, with annual increments at discretion.

Senior medical officers are to receive a minimum of £1250, rising by annual increments of £50 to £1650; and assistant medical officers or medical officers in departments £850, rising by annual increments of £50 to £1150. Scales for deputy medical officers, divisional or area medical officers, and officers holding mixed appointments are to be determined by joint negotiation and agreement between the parties. The new scales are to operate from Oct. 1 last; and they will at least improve the position of most of the more senior members of the public-health service. Unfortunately they do nothing to attract able men into the junior ranks, and little to give the service the prestige it needs.

Annotations

ALARMING NAMES FOR HOSPITALS

SOME words have such strong associations that they cannot be used neutrally. For many people the word "cancer" is identified with painful death; and the fact that this hopeless attitude is wrong does not mean that it can be ignored. As doctors we know that cancer is a disease like other diseases, and that many of its early forms are both painless and curable: we know these things because we have been taught pathology, have seen results of treatment, and have examined statistics. But lay people have not had these advantages: they only know that we can offer no certain cure for every case of malignant disease; and some of them have had to watch a painful death much more closely and painfully than most doctors. "Incurable" is another loaded word, suggesting lingering misery.

It is more than unfortunate, as has been pointed out from time to time,[1] that such words have found their way into the names of hospitals. Hospitals for "incurables," for "consumption," for "the dying" and above all for "cancer," give patients and their relatives a great deal of unnecessary pain and anxiety. One of our correspondents cited the case of a woman whose first intimation that her husband had malignant disease came through a telegram: "Bed available at the Cancer Hospital." This kind of shock can be extremely disturbing. Even those who know they are tuberculous, or dying, or that their disease is incurable, must feel some added load at the heart when they enter hospitals with such dooming names; for their friends the name underlines the tragedy. To talk of consideration for the patient, and the value of the psychological approach, and so on, and yet to inflict such useless pangs, implies a failure to think straight—or else to take enough thought. No doubt there are difficulties, financial or other, in the way of changing hospital names; but if so they should be examined patiently and minutely, and overcome. It may well be inconvenient to make changes: it cannot be impossible. Doctors at any rate will be unwilling to put convenience before the ease of mind of patients; and it lies in the hands of the medical staffs of these hospitals to convince their less informed, or less sensitive, lay colleagues that for good or evil much lies in a name.

HYPOGLYCÆMIA

IN their milder degrees the symptoms of hypoglycæmia are too vague and varied to be picked out from among the many similar symptoms which form the stock passwords into outpatient departments. The first derangements are in higher cerebral function and in mood: the ability to reason competently is lost and the subject may be unusually morose or garrulous, though he is often able to continue a routine task, such as driving a car. If the hypoglycæmia is a little more severe there are associated symptoms and signs of adrenaline release—particularly pallor, sweating, dilatation of the pupils, tremor, and feelings of fear, coldness, and hunger. If the attack progresses there may be a phase of neuromuscular overactivity before the onset of disorientation and, eventually, coma—which is sometimes associated with convulsions. The dominance of neurological disturbances reflects the unique position of glucose as food to the nervous system; the effects of glucose deficiency are practically identical with those of anoxia or disturbed enzyme function, for with each of these metabolism is curtailed.

Hypoglycæmia may be due to deficient glucose absorption (for example, in myxœdema and long-continued starvation); to excessive urinary loss, as in severe renal glycosuria; or to deficient glycogenolysis, which may occur in advanced cirrhosis and in von Gierke's disease. Lastly, there may be relative or absolute insulin excess. Relative excess is a feature of Simmonds's cachexia and Addison's disease, whereas true excess may be produced by islet-cell adenoma or carcinoma of the pancreas, or simply by functional overactivity of a histologically normal pancreas. To functional overactivity has been ascribed the postgastrectomy hypoglycæmic syndrome; otherwise such overactivity is found mainly in nervous patients, whose vague hypoglycæmic symptoms may easily be dismissed as not due to any organic cause. In practice the differential diagnosis of causes of hypoglycæmia is usually difficult only when considering islet-cell adenomas and functional hyperinsulinism. Typically the patient with an islet-cell adenoma has progressive symptoms, whereas with functional hyperinsulinism the symptoms are more capricious. Functional hypoglycæmia usually comes on some 4 hours after a carbohydrate meal, which presumably provokes excessive insulin secretion; the hypoglycæmia of an islet-cell tumour, on the other hand, is more marked as the interval since eating increases. Functional hypoglycæmia responds to frequent feeding on a high-protein diet,[1] whereas with islet-cell adenoma this treatment is not long effective.[2] If the fasting blood-sugar is persistently 50 mg. per 100 ml. or less, the cause is more likely to be tumour than functional; and it is worth noting that the fasting level gives more reliable information than the glucose-tolerance test.[3]

With regard to treatment, much depends on accurate diagnosis, for surgery can offer much only in cases of adenoma. Whipple [4] will operate only where the following three criteria are fulfilled: (1) attacks come on in the fasting state; (2) during an attack, or after a long fast, the blood-sugar is below 50 mg.; and (3) the attack responds readily to glucose. With this strict choice he found a tumour in 80% of the patients operated on. Whipple (whose surgical mortality was 12%) recommends that the duodenum be mobilised so that the head of the pancreas can be adequately palpated between fingers and thumb. In these cases the hyperglycæmic action of ether as anæsthetic may be desirable. When the criteria of organic hyperinsulinism are present and yet no adenoma can be found, subtotal pancreatectomy can be expected to produce a cure in 40% of cases and improvement in a further 10%[5]; not uncommonly the resected pancreatic tissue contains an adenoma which was previously overlooked. After operation temporary diabetes is common; indeed, it is a hallmark of success. The pathological classification of islet-cell tumours correlates poorly with the clinical classification, for many such tumours are non-functional and others which appear to be invading blood-vessels are in fact benign.[5] The rare true carcinoma of islet tissue may cause rapidly progressive hypoglycæmia, and is unique in that the more it metastasises the more the patient may gain in weight, since he increases his food intake to compensate for the excess insulin. Here surgery is almost always unavailing; as a last resort alloxan may be tried, though it has never been shown to produce more than temporary remission [6] and neoplastic β-cells appear to resist its action more than normal β-cells.[7] For functional hyperinsulism which responds insufficiently to diet,

1. *Lancet*, 1948, ii, 628, 707.

1. Thorn, G. W., Quinby, J. T., Clinton, M. J. *Ann. intern. Med.* 1943, **18**, 913.
2. Perkins, H. A., Desforges, J. F., Guttas, C. G. *New Engl. J. Med.* 1950, **243**, 281.
3. Whipple, A. O. *Amer. J. Med.* 1946, **1**, 424.
4. Whipple, A. O. *Surgery*, 1944, **16**, 289.
5. Howard, J. M., Moss, N. H., Rhoads, J. E. *Int. Abstr. Surg.* 1950, **90**, 417.
6. Brunschwig, A., Allen, J. G., Owens, F. M., Thornton, T. F. *J. Amer. med. Ass.* 1944, **124**, 212.
7. Conn, J. W., Hinerman, D. L. *Amer. J. Path.* 1948, **24**, 429.

adrenocorticotropic hormone (A.C.T.H.) has been employed for its diabetogenic action; sometimes the improvement has outlasted by some time the period of administration.[8]

ANTIBIOTICS IN OPHTHALMOLOGY

THE newer antibiotics were discussed by the Royal Society of Medicine's section of ophthalmology on Dec. 14. Outlining the place of antibiotics in the treatment of systemic affections, Dr. T. B. Maxwell remarked on the relative specificity of penicillin, streptomycin, 'Aureomycin,' chloramphenicol, and 'Terramycin'; and he brought out the advantages sometimes of administering more than one antibiotic.

That the results obtained in systemic affections cannot readily be applied to the eye was emphasised by Prof. Arnold Sorsby. He pointed out that ophthalmologists readily adopt the concept of the eye as functionally a double organ with a dioptric apparatus and a receiving mechanism. But pharmacologically, too, the eye is a double organ: the lids, conjunctiva, adnexa, and sclerotic may be grouped with the other systems to which the general rules for administration of antibiotics apply; but in the avascular part of the eye—the cornea and the aqueous and vitreous humour—a lower concentration results from systemic administration of antibiotics. The blood-aqueous barrier is responsible for low concentrations in the aqueous and vitreous, and indirectly in the cornea. In using the newer antibiotics the lessons from the use of penicillin have to be borne in mind. Against eye infections systemic administration of penicillin is not particularly effective. Local application seems to offer some promise; but drops are readily washed out, and ointments are only a little better. The most effective method of application is undoubtedly subconjunctival injection, which causes a depot of the agent to persist around the eye for some hours. If adrenaline or other vasoconstrictor is added to the subconjunctival injection the intra-ocular level is both higher and more persistent. With a dose of 1 million units of penicillin subconjunctivally, the concentration in the vitreous is almost as high as that achieved by the introduction of 5000 units directly into the vitreous. These results also apply to streptomycin, and probably also to aureomycin and chloramphenicol, though the behaviour of these last two drugs is very different from that of penicillin and streptomycin. For the present it seems that with these agents subconjunctival injection is still the method of choice; unlike penicillin and streptomycin, however, aureomycin, chloramphenicol, and terramycin are relatively insoluble, and existing preparations are fairly irritating. Professor Sorsby and Dr. N. B. Bailey have found that in the proteolytic type of corneal ulcer due to gram-negative bacilli good results are obtained by subconjunctival injection of streptomycin (0·5 g. in 1 ml. of solvent containing 10 minims of water and 5 minims of adrenaline); and this is a valuable addition to the control of corneal infections. Streptomycin systemically, said Professor Sorsby, has a definite place in the treatment of tuberculous keratitis and phlyctenular ophthalmia; in phlyctenular ophthalmia it both cuts short an acute attack and reduces the risk of recurrence. Sorsby and Bailey have found streptomycin of little use in iridocyclitis and in Eales's disease.

The effect of aureomycin on trachoma, superficial punctate keratitis, dendritic ulcer, and disciform keratitis was discussed by Mr. Derek Ainslie. Systemic administration has not proved particularly valuable. Trachoma has responded to aureomycin locally, while two cases of disciform keratitis did well on subconjunctival injection of 5 mg. Dr. Ruby Joseph likewise reported a good response, in a case of disciform keratitis, from two injections of 10 mg. of aureomycin. Nevertheless, the irritative reactions are an almost definite contra-indication except with pure aureomycin, which she was able to use in her most recent case of epidemic keratoconjunctivitis.

8. McQuarrie, I., Bauer, E. G., Ziegler, M. R., Wright, W. S. *Proc. Soc. exp. Biol., N.Y.* 1949, **71**, 555.

A STUDENT TUBERCULOSIS CENTRE

STUDENTS are more liable to contract tuberculosis than other young people. It has been estimated that 0·2% of those in universities, technical colleges, and training colleges, and 0·9% of those studying medicine, are obliged to interrupt their studies for a term or more because of the disease; and this leaves out of account those who are able to carry on despite a tuberculous infection.

On another page Prof. F. R. G. Heaf, Mr. C. R. Morris, and Sir Alan Rook announce the launching of the British Student Tuberculosis Fund. A committee to administer the fund has been set up, on which are represented student and teacher organisations, and bodies interested in the health of students and in tuberculosis. The aims are clear-cut: to give help of every kind to British or other students with tuberculosis, and to set up a tuberculosis centre where students, after a period of sanatorium treatment, may complete their recovery and also carry on with their studies. Centres of this kind have been maintained for some time in France, and the committee have already made a study of them. The incidence of tuberculosis among French students (numbering some 130,000) is 1·4%. The service helps them all, and throughout treatment they are encouraged—subject to the recommendations of their physician—to go on with their studies. They stay, on average, 10 months in a sanatorium and 10 months in the reablement (or "post-cure") centre; and 60% of them are able to sit for their examinations.

The committee define the word "student" as "a senior or student member of a university or other institute of higher education"—a definition which (whether intentionally or not) seems to open the gates, not only to undergraduates, students, and teachers, but to most postgraduates, regardless of whether they still have any connection with their universities. The numbers thought to be affected, however, amount only to 250; and it is proposed that the centre should begin with 100 beds. The cost of buying, converting, and equipping such a centre is put at £50,000; and since this is an enterprise on behalf of students, and largely initiated by students, the proposals for raising the money are pleasantly vigorous and racy. The national appeal committee have set for every university, college, medical school and teaching hospital in the country a target of 2*s.* 6*d.* per student—not necessarily to be raised by donations (though many may wish to give this amount or more) but rather by such things as athletic events, rag days, concerts, plays, dances, socials, carol singing, jumble sales, stamp sales, or in any other ways that ingenuity suggests. Every interested centre of education is being asked to set up a strong appeals committee, who will open their campaign by writing to every university or college society (even chess clubs will be swept into the arena) to know what activity each can arrange to raise funds for the appeal. Illustrated articles will appear in student journals; the local press will be asked to help; teachers will be invited to make announcements at the beginning or end of lectures; posters will be available; college clubs will levy, on behalf of the fund, "entertainment tax" at their functions; and the national appeal committee, in London, will sponsor lecturers to be invited down, provide slides to appear in cinemas, and give any other help it can to the local committees. University College, London, is leading the way with a plan designed to bring in several thousand pounds.

Special Articles

DERMATOLOGICAL ASPECTS OF UNEMPLOYMENT AND RESETTLEMENT

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OCCUPATIONAL resettlement after prolonged incapacity through skin disease has received little attention. Experience of such resettlement has been confined to the Services (Bolam 1945), where patients were under military discipline. Restoration of function for return to duty was the prime concern, and the willing and fit man was easily fitted into a suitable job at the end of his course, while the unwilling, or completely unfit, were released into the civilian community. All these circumstances contrast strongly with those encountered in civilian practice.

The Disabled Persons (Employment) Act, 1944, was intended to help disabled people whose physical or mental handicaps were substantial and who might have to change their employment. From my experience of the work in employment exchanges in the north-west of England I have tried to assess what the Act has done for people disabled by skin diseases. I shall also comment on the extent of the problem, on the resettlement results in a group of these patients, and finally on the contributory causes of unemployment in a separate group of 50 registered disabled unemployed persons suffering from skin disease.

Under the Act the disablement resettlement officer (D.R.O.) maintains a register of employed and unemployed disabled persons, and his main concern is to resettle the unemployed satisfactorily in suitable occupations. Besides facilities for placing them in jobs, he also has at his disposal valuable training schemes for skilled work. For the more severely disabled, there are sheltered employment and ancillary home working schemes. Industrial rehabilitation in the early stages of recovery is provided at 13 centres recently established throughout the country (Ministry of Labour and National Service 1948), where, by means of expert vocational guidance, the disabled are helped to adapt themselves to work most suited to their disability and remaining abilities.

THE DERMATOLOGICALLY DISABLED

Dermatological cases present industrial medical officers with a major medical problem and personnel managers with a difficult management and resettlement problem (Hadley Smith 1947, Crosthwaite 1946, Schwartz et al. 1947). There seem to be no accurate figures for morbidity due to skin disease in the civilian population, but in the Army skin diseases are one of the main causes of admission to medical units, ranging from around 15% of total admissions in temperate climates to something approaching 20% in tropical and subtropical zones (Army Medical Statistical Department, personal communication).

Paradoxically, of 935,007 registered disabled persons (R.D.P.) over the whole country, only 9512, or about 1%, were registered with skin disabilities, and of these 689 were unemployed (October, 1949). Possible explanations of these low figures are a natural disinclination on the part of these patients to register their disabilities, a well-known reluctance on the part of works managers to employ them if the diagnosis is known, a tendency for pre-employment medical examination to prevent their obtaining employment, and a lack of appreciation on the part of their medical advisers of the value of early and satisfactory resettlement as a form of therapy. Alternatively, the figures may portray a satisfactory situation and suggest that no real problem exists.

Table I gives five selected types of disability, showing the total registered disabled persons—the number unemployed and the latter expressed as a percentage of the former—with the purpose of providing some impression of their relative success in obtaining and retaining employment. The unemployed are classified in two ways:

1. Those capable of ordinary employment, as opposed to those likely only to obtain sheltered employment.
2. Those unemployed under and over 26 weeks.

Similar figures for all disabled are included.

Only 2·6% of those registered with amputations of one arm and one leg are unemployed—a figure which reflects the relative ease of resettling the obviously disabled man. Internal diseases—such as bronchitis and heart-disease, which respectively account for 10·9% and 9·4% of the registered disabled unemployed—present a problem second only to that of pneumoconiosis, which in South Wales is responsible for unemployment in nearly a third of those registered as disabled by the disease. In contrast only 5·8% of those registered with pulmonary tuberculosis are unemployed. The percentage of unemployment among those registered as disabled by diseases of the skin and dermatitis (7·2) is about the same as the percentage of unemployment among all registered disabled persons (7).

TABLE II

Regions	Registered disabled persons			Unemployed registered disabled persons		
	Total	With skin disabilities	% of total	Total	With skin disabilities	% of total
London and S.E.	217,690	2506	1·17	11,108	144	1·3
Eastern	43,634	486	1·11	2021	31	1·55
Southern ..	38,426	410	1·06	2179	33	1·52
South Western ..	45,142	488	1·08	2962	29	1·04
Midland	82,295	825	1·0	2713	49	1·8
North Midland ..	64,614	729	1·15	2091	29	1·4
E. and W. Ridings	83,588	813	1·02	4559	30	·66
North Western ..	142,160	1422	1·0	9518	115	1·2
Northern.. ..	65,233	516	1·26	7790	58	·75
Scotland	85,756	615	0·72	8405	53	·63
Wales	66,199	702	1·08	12,021	118	1·0
Gt. Britain ..	935,007	9512	1·02	65,367	689	1·05

TABLE I—SELECTED GROUPS OF DISABLED PERSONS, OCTOBER, 1949

Disablements	Total registered disabled persons	Unemployed				Duration of unemployment	
		No. of disabled persons	% of total registered	Capable of ordinary employment	Requiring sheltered employment	26 weeks and under	Over 26 weeks
Amputation one arm and one leg ..	14,500	375	2·6	337	38	204	171
Bronchitis	58,448	6376	10·9	5572	804	2910	3466
Diseases of heart	59,029	5539	9·4	4516	1023	2738	2801
Silicosis, coalminers	14,803	4760	32·1	4271	489	1054	3706
Diseases of the skin, dermatitis ..	9512	689	7·2	647	42	428	261
Tuberculosis (respiratory)	47,132	2737	5·8	2260	477	1651	1086
Total all disabled	935,007	65,367	7	55,049	10,318	32,694	32,673

TABLE III—INSURED POPULATION AND NUMBER OF PERSONS WITH REGISTERED SKIN DISABILITIES FOR SELECTED TOWNS AND WHOLE COUNTRY

Selected employment exchanges	Insured population	No. of R.D.P.s on register with skin disabilities	% of insured population
St. Helens ..	51,000	68	0·133
Northwich ..	18,508	42	·22
Horden	13,171	11	·09
Wigan	44.880	55	·122
Walkden ..	13,920	16	·114
Glasgow ..	560,581	149	·026
Leeds	267,400	103	·039
Sheffield ..	242,390	82	·034
Cardiff	133.720	42	·032
Birmingham ..	609,895	210	·034
Manchester ..	501,640	145	·029
Willesden ..	89,550	28	·031
Gt. Britain ..	20,500,000	9512	·046

The age-group distribution of skin disabled unemployed also resembles that of the whole unemployed disabled population, showing the same correlation between age and unemployment. Of the 261 persons with skin disease who were unemployed for more than twenty-six weeks 209 were over 41.

DISTRIBUTION OF CASES

Table II shows the division, according to region, of registered disabled persons and those registered with skin disabilities. Apart from the relatively low percentage for Scotland, the skin cases appear to be evenly distributed through the country. Table II also shows the total unemployed disabled persons and those unemployed with skin disabilities. Resettlement seems to be most satisfactory in Scotland and the East and West Ridings of Yorkshire, and least satisfactory in the Midland region.

The figures for the cities shown in table III are well under the national average. Of these, Leeds has a slightly higher percentage than any of the others. These low figures are counteracted by a high incidence in towns where industry is purely chemical—e.g., Northwich.

Coalmining appears to account for the higher incidence in Wigan and St. Helens, though the high figure in the latter is probably partly attributable to the glass-processing and ancillary industries. The incidence in pure coalmining areas such as Walkden, Lancashire, and Horden, co. Durham, is twice as great as the national average.

A SAMPLE FOLLOW-UP

A series of 100 consecutive persons with skin disabilities who applied to become registered disabled persons at exchanges in the North West were medically examined and their progress in resettlement was followed for a year (table IV).

Resettlement was regarded as successful if the man was working at the job six months after he had been placed in it. The placing performance of the D.R.O.s was encouraging, but many of the cases were unemployed for some time before finding work. The success of rehabilitation and resettlement schemes will vary locally and nationally with the labour demand. Analysis of the results of the 100 cases by diagnostic groups was not significant. It was, therefore, felt that a detailed review of a group of unemployed skin cases might be useful.

ASSESSMENT OF CAUSES OF UNEMPLOYMENT

From exchanges in the North West 50 unselected unemployed skin cases (43 men and 7 women) were medically examined, and their occupational, social, and medical history was taken in detail. The method of assessment used is shown in table V.

The figure on the opposite page shows the relative importance of each factor in maintaining the unsatisfactory condition of the patient. It will be seen that the malady itself ranked low in comparison with the dominant position of unsatisfactory work-records and social problems.

Length of Unemployment

Unemployment among the disabled in a time of full employment—98·5% of insured men are today working—is itself a disability due to many factors and leads to further unemployment (Hewitt 1949). It indicates deep-seated medico-social difficulty and it is found among inadequate people. The point-rating here is based on duration of unemployment up to the time of interview. The shorter the duration of unemployment the more favourable the prognosis.

TABLE IV—RESULTS OF ONE-YEAR FOLLOW-UP IN 100 UNEMPLOYED DISABLED SKIN CASES

Satisfactorily resettled ..	36	Rejected as unsuitable for D.P. register—no evidence of skin disability. No follow-up	9
Found work themselves and satisfactorily resettled	19	Not satisfactorily resettled	1
		Failed to reply	5
		Found work but not maintained	1
Number in employment at the time of examination	10	Unemployed	19
	65		35

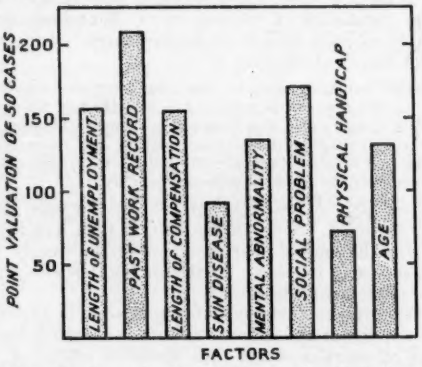
Previous Work and Unemployment Record

The rating of work-records was based on a knowledge of the man's employment record since leaving school. Those most highly rated were men with long spells of unemployment or those with a history of a large number of jobs in a relatively short period interspersed with

TABLE V—METHOD OF ASSESSMENT

Point-rating	6	5	4	3	2	1	0
Length of unemployment	37–48 months	25–36 months	13–24 months	7–12 months	13–26 weeks	5–12 weeks	1–4 weeks
Work record	Very bad	Bad	Fair	Fairly good	good	Very good	Excellent
Length of compensation	37–48 months or still in receipt of whole or partial	25–36 months	13–24 months	7–12 months	13–26 weeks	5–12 weeks	1–4 weeks
Severity of skin disability (objective) ..	6	5	4	3	2	1	0
Degree of mental abnormality	6	5	4	3	2	1	0
Degree of social problem	6	5	4	3	2	1	0
Extent of other physical handicaps ..	6	5	4	3	2	1	0
Age in years	61 +	56–60	51–55	46–50	41–45	36–40	35 and below

periods of unemployment; the lowest rated were those who had remained in the same job for long periods with no unemployment, or those with a few changes of jobs and no intervening unemployment. Allowances were



made for the irregularity of the work of the unskilled labourer and the economic fluctuations which bring unemployment first to him. A man's working career was assessed on his record before the onset of the skin disease; for this new factor was often a heavy handicap which disturbed his former occupational stability. Grossly unsatisfactory work-records were the salient feature in this group of cases. To many the onset of the skin trouble seemed to suggest a means of early retirement with a relatively contented state of mind. Others, after a series of attempts to return to work for successively smaller periods, lapsed into a state of complete unemployment. In some the skin condition began on return to work after long spells of unemployment, or (in the case of the women) on returning to work because of economic necessity or war exigency after a long settled period of domesticity. In the majority, however, the skin condition appeared to be the culminating upset in a working life generally unsatisfactory from other causes and seemed indistinguishable from other types of breakdown.

Occupational resettlement depended on the kind of work available in the local industries. The general demand among these men and women was for light and clean work when previously they had only been accustomed to the heaviest and dirtiest work. For example, a woman of 54 of low intelligence who had always worked as a charwoman sought a job free from dust, liquids, oils, chemicals, and fumes. Any job she could be offered was of course unsuitable because it was likely to provoke a recurrence of the skin condition.

Compensation or Industrial Injury Benefit

This was rated according to the length of time for which it had been received. The heaviest rating, 6, was given to those who had received compensation for 37–48 months or to those who were still in receipt of partial or total benefit. Most of this group feared that return to work would result either in their rejection or loss of compensation payment. The longer the compensation and invalidity, the more unhealthy becomes the patient's attitude towards a return to work. Discussions with shop stewards, union secretaries, and solicitors, and the unnecessarily multiplied medical consultations, all tend to accentuate his anxiety about his skin condition and reduce the likelihood of a healthy attitude towards employment.

Degree of Skin Disability

The following types of skin disease were encountered:

(1) *Eczema and seborrhœa* (47 cases):

Seborrhœic dermatitis	18
Unspecified eczema	24
Sycosis	2
Acne vulgaris	2
Acne rosacea	1

(2) *Other conditions*:

Psoriasis	1
Chronic leg ulcer	1
Lupus erythematosus	1

The 18 cases of seborrhœic dermatitis had easily recognised lesions in the scalp, retro-auricular axillæ folds, pubic region, and interdigital spaces of the feet. The "*eczema*" lesions were chiefly of the patchy or discoid type and were largely restricted to the extremities. A few had a pompholyx response with vesicles between the fingers. Most of the cases were of the chronic type with thickened lichenified skin, accentuation of the normal skin markings, erythema, desquamation, and fissuring. A few showed palmar discs of hyperkeratosis and fissuring.

Both cases of *acne vulgaris* were in young men: they were slight to moderate in severity, but they were associated with an abnormal degree of self-consciousness. Both these patients had unsatisfactory work-records and domestic social problems. The patient with *acne rosacea* was a young man discharged from the Forces with a severe anxiety neurosis after being a prisoner-of-war in Japan.

Of the 2 cases of *seborrhœic sycosis*, 1 was moderately severe with active lesions and marked residual scarring in a man with a bad work and sickness record and a parallel history of miners' nystagmus. In the other case no activity was visible but the man had an atrophic and telangiectatic skin, the result of excessive X-ray treatment. He had an obsessional attitude towards employment lest his skin condition should be revived by any form of work.

The other 3 patients were:

1. An elderly man with slight *psoriasis* on both legs. He had severe myocardial degeneration with early symptoms and signs of congestive failure which he chose to ignore in favour of the visible skin disorder.

2. An inadequate youth with a large *leg ulcer* of uncertain origin which had not responded to hospital treatment (inpatient or outpatient) over three years. He had done little work before or after its onset and had become inured to a state of chronic invalidism.

3. A woman of 26 with a severe disfiguring facial *lupus erythematosus* with gross circumoral scarring. She was four months' pregnant, and had a child of 7, a lodger, and a large house to look after. She was looking for work because her husband, a drunkard, ill-treated her and offered no financial support. Her work-record was good but the combination of factors had made her unemployable.

In only 3 patients was the objective appearance of the skin trouble likely to render employment difficult.

The 35 who had previously been certified as suffering from industrial dermatitis all belonged to the seborrhœic eczema group and were indistinguishable from the constitutional type. In 14 of the 35 there were no active skin lesions, and their unemployment was due to other factors, such as the fear of recurrence if any work was undertaken. Such assertions as "The skin trouble will come back if I get a job and sweat," or "I am not taking any risks at all through going back to work," give some idea of this frame of mind. The sickness-records of these patients were particularly unsatisfactory, but it was difficult to elicit a true picture. Many of them in the early stages of the condition, after an initial spell off work, had returned to their old employer for a few days or weeks, but recrudescences had led to successively longer spells of sickness and served to convince the patient that his skin condition was due to irritants encountered at work—though most of them on their return had been placed in jobs far removed from any primary irritant and in which no possible hazard was present.

Many of the cases had occurred during war-time in Government factories and the personnel had been maintained in light jobs with some success until the end of the war. They had then fallen back on compensation and many were still waiting for their claims to be settled. Treatment of these cases by the works medical officer was unsatisfactory.

Mental or Emotional Abnormality

Though most of the skin diagnoses were of the eczema-seborrhœa diathesis, no mental characteristics common to all of them were apparent. The majority were of inferior calibre physically and mentally, and the general term constitutional inadequacy was appropriate. Sub-normal intelligence was the most usual finding. It was well defined in 12 cases and seemed excellent ground for superimposing emotional abnormalities, of which the commonest variety was a mixture of obsession about the skin condition and an almost hysterical state inhibiting the use of the hands and preventing the patient from doing any work. The reluctance to return to work may have been based on dread of recurrence of the skin condition, but it seemed much more to resemble a hysterical symptom. This view was supported by the general apathy of these patients, their lack of ambition to work and earn a wage, and their obvious dependence on others, including the State, coupled with their unsatisfactory work and sickness records. Those who had had many jobs were sometimes obviously unstable in temperament and often moved from one firm to the other on grounds of industrial misconduct. Persistent anti-social behaviour was noted in 3 patients, one of whom was the child of divorced, drunkard parents, educated at a reformatory school. She had deserted her husband and four young children. The skin disability, though healed at the time of the interview, was her third industrial accident that had been compensated by lump-sum settlement within five years.

In the following 3 cases there was a severe anxiety neurosis :

1. A collier with an excellent work-record and a large dependent young family. He had what appeared to be a constitutional *seborrhœic dermatitis* and, in addition, a moderate degree of hypertension. When seen he was actively discussing his case with solicitors, union officials, &c., and though technically seeking employment and receiving unemployment benefit, he had been advised by his solicitors not to return to work and was greatly upset by his dilemma.

2. An elderly man, with *eczema* on the hands since childhood, who had abandoned an exceedingly good lifelong business three years before on hearing that his only son had been killed in a flying accident. He was in a most pathetic brokendown state with exacerbation of the skin condition and a moderate degree of hypertension.

3. A woman of 32 who had recently married a man of 81 and had as a result been ostracised by both families. She was also pursuing her claim for industrial injury benefit on account of a coincidental outbreak of *eczema* on her hands.

The aggrieved and aggressive attitude associated with compensation cases was obvious both where the case was still pending and where there was dissatisfaction with the settlement.

Social Problems

According to the Registrar-General's classification of *social class*, 3 belonged to grade III, 1 to grade IV, and 46 to grade V. Because of their disability, the 4 men in grades III and IV were now seeking unskilled work.

Their *school records* showed that 45 had attended elementary schools but 6 were still in a very low form when they left ; 1 had received his whole education in an orphanage and 1 at a special school for the deaf and dumb ; and 2 had been educated chiefly at reformatory schools. Only 1 had attended a secondary school, and he had left after three years because of difficult domestic circumstances.

The *income* of the group consisted of unemployment benefit, extended benefit, or payment from the Assistance Board. In 9 cases compensation, whole or partial, was still being paid, and a number were still living on the remains of their lump-sum settlement. As one man said, "My compensation is my wage now." Another revealed his weekly compensation cheque for £2 8*s*. 11*d*. with some satisfaction. The wives of 5 men were working ; many men had adult children supporting them or living with their wives and families in lodgings at the parental home. Of the 7 women, 3 had husbands who were working, and the remaining 4 women were housekeeping for parents or siblings who were wage-earners. Many were receiving family allowances.

The total family income of one man who was staying at home to do the housework was £8 13*s*. 4*d*. He had no signs of active skin disease and was keeping two pigs and fifty head of poultry. He was getting compensation and he remarked that if he had a bit of capital and could get his case settled, he would like to set up with pigs and poultry.

Other social problems included people who were separated, or divorced. Some of the elderly men had invalid wives. Deaths among near members of the family were another source of trouble ; 2 patients had been to prison, and 1 was an Army deserter.

The fear of skin disease and dermatitis is prevalent among employers and fellow-workers, who are generally ignorant of its real nature, are afraid of infection, and associate it with uncleanliness and venereal disease. The self-consciousness of the man or woman who has visible skin lesions constitutes a social disability, which, together with the skin disease itself, produces an ostracism like that experienced by the epileptic and tuberculous. industrial dermatitis, real or alleged, is more destructive of morale than is generally recognised.

Other Physical Handicaps

Of the 50 patients, 28 had additional disabilities, though few were serious. Hypertension (5), dyspepsia (5), bronchitis (3), and deafness (3) were the most common. There was a deaf and dumb youth of 18 and a man with severe myocardial degeneration, but in the remaining 10, the second disability was slight. Of the cases of bronchitis 2 had associated eczematous lesions from childhood and were of the syndrome comprising eczema, asthma, and hay fever. Of the 5 cases of dyspepsia 2 had duodenal ulcers. Most of the group were of poor physique but there was no evidence of malnutrition secondary to poverty.

Age

Increasing age worsened the prospects of resettlement : as one man remarked "If you get dermatitis, no employer wants you, especially as you get older." Age in itself is a disability, particularly amongst men who are only capable of unskilled labour, and in this group 36 men were between 41 and 64 years old. Age is one of the most important factors considered by employers when hiring labour and certainly one of the most easily ascertainable. Training for a new skill is seldom practicable in men over 35. Furthermore, the lighter jobs, most desirable for the elderly, are usually done by women.

DISCUSSION

This is an investigation into the failure of people with chronic skin diseases to adapt themselves to their disability, which leads to the interruption of their working life by sick absence and unemployment. It is hoped that the findings will help workers who are trying to prevent this happening. Imperfect mental adaptation to chronic disability plays a great part in long-continued sick absence from work and unemployment amongst disabled persons, particularly those with chronic skin disease.

People with skin diseases provide an invaluable opportunity for investigation, because the extent of their physical incapacity can be directly observed. Assessment of incapacity from emotional, mental, and social problems is purely subjective and cannot be scientifically accurate ; but no apology seems necessary for their inclusion in this paper, in view of their paramount importance and

the tendency for them to be omitted in the development of specialties.

Fuller consideration of problems other than the purely dermatological ones may enable doctors to help patients before the stage of chronic sickness and unemployment, or resignation to both, is reached.

The points raised serve to show the close relation between the disability state, social environment, and occupational record, and that each can only be fully appreciated by consideration of the others. The basic causes of the unemployed state and of prolonged sick absence from work appear to have much in common.

Valuable resettlement services are available for skin cases which are not being fully used. The largest group of sufferers are those ostensibly breaking down with industrial dermatitis, and though they present themselves with skin trouble they have many other problems which tend to be lost sight of.

I have not tried to compare the factors recognised in this series with those responsible for inability to obtain work among other groups of disabled. But I believe that similar research among these groups would give similar results.

SUMMARY

The resettlement of skin cases seeking employment at a late stage of their illness is difficult to secure. A study has been made of 50 unemployed disabled persons suffering from skin disabilities registered at employment exchanges in north-west England. Histories were taken, social detail and employment records analysed, and the patients clinically examined. The following main points were elicited :

Unemployment amongst these patients is due to more than one factor.

Out of 50 patients 46 were unskilled.

Out of 50 patients 47 were found to have seborrhœic eczema.

Out of 50 patients 35 had been certified as suffering from industrial dermatitis.

The effect of such diagnosis and certification seems usually to have been unfavourable to prognosis.

Unemployment in registered disabled persons with skin disease is a symptom calling for full medical social investigation.

I am indebted to the Regional Controller and my colleagues in the Ministry of Labour, North West region, for their helpful coöperation, to Prof. R. E. Lane for criticism, and to Dr. J. H. Twiston Davies for encouragement and advice in the preparation of this paper.

REFERENCES

Bolam, R. M. (1945) *Brit. med. J.* ii, 539.
Crosthwaite, B. (1946) *Brit. J. phys. Med.* **9**, 34.
Hadley Smith, J. D. (1947) *Brit. J. soc. Med.* **10**, 233.
Hewitt, M. (1949) *Lancet*, ii, 523.
Ministry of Labour and National Service Gazette (1948) **9**, 301.
Schwartz, L., Tulipan, L., Peck, S. M. (1947) Occupational Diseases of the Skin. London.

"... In the clinical years, too, instruction is pieced together out of the contributions of independent departments, which may differ as much in their philosophy as in their techniques. Too much of it is given in the hospital wards, where the student finds only people sick enough to be abed. For a sample of the great majority of patients, who are not sick enough to be abed, he must go to the outpatient department, which is commonly organized in such a way that it is hard for the student to learn, or for the patient to find, coherent and comprehensive medical care. Only by the grace of God (which rarely becomes operative until after the young doctor has his medical degree, and not always then) does the student of medicine learn today to think about medicine as a whole." —Annual Report of the Commonwealth Fund, 1950.

PINK DISEASE

LECTURE BY SIR STANTON HICKS

Sir STANTON HICKS, speaking on Dec. 12 at the Ciba Foundation, London, traced the history of the recognition of pink disease, particularly in his native Australia. At one time, he said, this disorder was known by nearly thirty different names, including erythrœdema. The title "pink disease" was adopted in 1914 by Swift, of Adelaide. In his later reports Swift emphasised that this is no rare disease—an observation fully confirmed since then.

Cheek, in 1949, found 136 cases in the records of the Adelaide Children's Hospital over a 10-year period—and this despite a policy of treating such cases in their homes to minimise cross-infection. Of these 136, 18 died, and half of the deaths were attributed to bronchopneumonia. Cheek noticed that the areas with heavy incidence of pink disease correlated roughly with those of swayback in sheep. Swayback was known to be associated with cobalt deficiency ; and so he turned to the possibility that a mineral trace-element deficiency might also give rise to pink disease. With the help of a spectroscopist to determine plasma-cations by flame photometry, he studied the sera of 16 cases of pink disease and 16 controls. The plasma-sodium levels of the control group were normal, whereas in the cases of pink disease the level was consistently lowered beyond the limits of error of the method. This finding, and severe non-pitting œdema in a fatal case, directed his attention to electrolyte and water metabolism.

At this point he consulted his former teacher, Sir Stanton Hicks, head of the department of physiology in Adelaide University, and a large-scale investigation was planned. Clinicians were invited to coöperate by referring their cases to the hospital, and in consequence the earlier finding of lowered plasma-sodium was confirmed. Hæmoconcentration, as shown by the hæmatocrit and red blood-cell count, was also common, and had in fact been recognised in this condition for some fifty years. There thus emerged a picture of decreased plasma and extracellular-fluid volume, sometimes associated with overhydration of the cells.

The milder cases were treated with extra sodium chloride (about 8 g. daily), and the more severe cases also had 3 mg. deoxycortone on alternate days. The response to this treatment was uniformly good, reducing the average stay in hospital from 3–4 months to as many weeks. The main symptoms of irritability, apathy, and sleeplessness usually disappeared in about 2 weeks, but the extremities might remain pink a little longer.

With such a background Hicks and his group had evolved a theory of "fractional hypofunction of the adrenal cortex" to account for the disease. The maximum age-incidence coincided with the period of gross morphological change in the adrenal cortex, in which the adult layers developed to replace the involuting, relatively larger, fœtal cortex ; at such a transitional period disturbances of function might be especially prone to emerge. In South Australia the allergic diseases of infancy also had a peak at this age. Another theory, which the Adelaide school had earlier favoured, was of functional overactivity of the adrenal medulla. This would explain the tachycardia, high diastolic blood-pressure, and common initial fever and excessive sweating, but it did not account for the newer findings of low plasma-sodium and the response to sodium chloride and deoxycortone. The infection theory certainly could not be eliminated, but the common occurrence of large tonsils and adenoids might simply indicate adrenal cortical hypofunction. Possibly infections brought out symptoms of an adrenal cortical deficiency which was previously latent. The theory of mercury poisoning was still sub judice, largely from confusion due to mercury

in teething powders sometimes given for symptoms which might be those of incipient pink disease.

CLINICAL PICTURE

Clinically, the child, aged usually between 6 months and 2 years, was abjectly miserable, with apathy, irritability, insomnia, and anorexia. The skin of the extremities was swollen, sweating, and usually cold. There was a sluggish circulation through dilated capillaries, giving a pink colour in warm surroundings and a cyanotic hue in cold. The skin was continually burning, tingling, or itching, and was hypersensitive to common stimuli, so that warm water felt painfully hot. Such swollen, raw-looking, sweating extremities, sometimes also desquamating and injured by continuous rubbing, contrasted strongly with the dry scaly skin over the emaciated trunk. The muscles were hypotonic and weak, although continually producing writhing and wriggling movements; and the tendon reflexes were reduced or absent. Characteristically the child buried his head in the pillow to protect his eyes from the light, and persistently rubbed and scratched his tormented hands and feet. Early on there might be fever as well as tachycardia, raised diastolic blood-pressure, coryza, and leucocytosis. For many months after the acute phase the child's health was likely to be subnormal.

RESPIRATORY MECHANISM AND HYDRATION

Fœtal arterial blood was only about 63% saturated with oxygen, and yet the oxygen utilisation reached 75% as against 31% in the mother, whose arterial oxygen saturation was 95%. Armstrong had shown that in animals intermittent anoxia led to adrenal cortical hyperplasia. Furthermore, adrenal cortical extract improved the survival-rate of anoxic animals. These facts suggested that in infants with inadequate adrenal cortical reserve the respiratory mechanism might be abnormal.

At birth the proportion of body-water was only 10% more than in the adult, but the newborn had relatively much more in the extracellular compartment. Bearing in mind that the infant's kidney could not concentrate well, and that glomerular filtration approached the rate in adults only after the first 5–6 postnatal months, the special vulnerability of the infant to factors altering its hydration became understandable. In South Australia mothers tended to limit their infants' salt intake so that, especially in hot weather, there might be actual sodium deficiency; and perhaps this might explain the relatively high incidence of pink disease in this area. Administration of hypotonic saline only accentuated the disturbance, whereas hypertonic saline corrected it. If older marantic children who were having episodes of cyclical vomiting were examined for adrenal cortical hypofunction, a tendency to low plasma-sodium might be found; and an unduly high proportion of these patients had a history of previous pink disease. These cases, Sir Stanton suggested, might be due to a milder deficiency of adrenal cortical reserve, and might also respond to treatment with sodium chloride.

STOMATITIS

A vote of thanks was proposed by Dr. S. L. SIMPSON and seconded by Prof. A. A. MONCRIEFF. Both admitted that some features of pink disease were still difficult to understand. Professor MONCRIEFF mentioned in particular that the stomatitis of the textbook description of the disease was notably absent from its modern form. It was hard to explain the raised diastolic blood-pressure on a basis of adrenal cortical insufficiency; and his experience in England had not corroborated the findings of low plasma-sodium levels. Possibly the pink disease of Australia was different from that in this country.

Medicine and the Law

The Courts and the Period of Gestation

WITHIN limits carefully defined in legal textbooks our courts confess judicial knowledge of certain simple facts of nature without requiring them to be proved by evidence. In Preston-Jones *v.* Preston-Jones,[1] decided in the House of Lords on Dec. 14, Lord Simonds observed that it had never been doubted that the court had judicial knowledge of the normal period of human gestation.

The normal period, it seems, has been variously stated; it was taken, for example, as 270–275 days in 1887 (Bosvile *v.* Att. Gen.) and as 273–278 days in 1889 (Burnaby *v.* Bailie). Subsequent litigation has taught the judges something about abnormal periods. In the Gaskill case in 1921 Lord Birkenhead held that a period of 331 days could not be regarded as impossible in the then state of medical knowledge. In Wood *v.* Wood, where there was no medical evidence, the Divisional Court took the same view of a period of 346 days. Early in 1949 the Divorce Court allowed even 349 days to be a possibility (Hadlum *v.* Hadlum [2]). As the number of days continued to rise, the judges clearly found it necessary to draw the line somewhere. In the recent Preston-Jones case the figure of 360 was in effect (though the judges were not unanimous) declared to be on the wrong side of the line.

Mr. and Mrs. Preston-Jones were married in April, 1941; a daughter was born a year later. On Aug. 13, 1946, a second child was born. The husband petitioned for divorce in the following November. He contended that this second child had been conceived between Aug. 29, 1945, and Feb. 13, 1946. During the whole of that time he was absent from the United Kingdom while his wife remained here. He alleged that it was not his child and that its conception was the result of an act of adultery. The divorce commissioner dismissed the husband's petition. The Court of Appeal ordered a re-hearing. The case being re-opened, Mr. Commissioner Blanco White found that the husband had been absent from the United Kingdom between Aug. 17, 1945, and Feb. 9, 1946. The wife had suggested that her husband had visited her in the intervening November, but this the commissioner did not accept. He further found that the birth of the child (which weighed 8¼ lb.) was apparently normal and that it could not have been begotten as the result of marital intercourse on or after Feb. 9, 1946, the date on which the husband arrived home. The commissioner had then to ask himself whether the fact that at least 360 days had elapsed between the last possible intercourse between husband and wife and the birth of the child, together with the medical evidence, put it beyond reasonable doubt that it was not the husband's child. The commissioner, who apparently found the medical evidence inconclusive, held that he would not be justified in finding that the wife had committed adultery; he dismissed the petition. Once more the husband appealed and once more the Court of Appeal directed a re-hearing; it might, it seems, have granted the husband a decree outright, had there not been some question of the admission of certain correspondence at the trial.

By a majority of four to one the House of Lords has now allowed the husband's final appeal and has remitted the case to the High Court in order that the proper decree may be granted.

There remains, however, a further problem of judicial knowledge or ignorance in cases of this kind. By the normal period of gestation the courts mean the time between conception (the union of the male and female cells) and birth. Recent cases have caused the judges to consider the possible interval between coitus and fertilisation. In the Gaskill case it was suggested that this latter interval might be so long as 21 days; in the Hadlum case one of 14 days was referred to. In M.T. *v.* M.T., in the latter part of 1949, when the divorce judge refused to accept the possibility of a normal healthy baby being born after an interval of 340 days between coitus and birth, a gynæcologist had stated in evidence that he had never heard of an authentic instance of an

1. See *Lancet*, 1949, i, 586.
2. *Ibid*, 1948, ii, 123.

interval of 21 days between coitus and fertilisation. Lord Simonds asks if judges can, without evidence, take note of the possibility of some such interval. Can they, without evidence, he asks, refuse to entertain the possibility of a 30-day, 60-day, or 90-day interval between coitus and conception? He thought that ordinary men and women would regard it as a fantastic suggestion that a normal child born 360 days after the last intercourse between husband and wife could be the child of the husband. "It is to me repugnant," said Lord Simonds, "that a court of justice should be so little in accord with the common notions of mankind that it should require evidence to displace fantastic suggestions." In the Preston-Jones case the only medical evidence was that of a doctor whose training and everyday working practice must have made him familiar with the ordinary problems of gestation and birth. This witness admittedly had not studied the problem of the maximum period from the time of coitus to the time of the impregnation of the ovum; but his earlier answers showed that he regarded as impossible an interval which would defer a normal child's birth until 360 days after coitus. The doctor was, in Lord Simonds's opinion, entitled to give that evidence "as a matter of competent medical opinion" even though he had made no special study of the subject. The divorce commissioner was not justified in disregarding the doctor's evidence. He was, as a matter of judicial knowledge, entitled to know that there were abnormal cases of gestation as well as a normal period; but he was not entitled to set his own view of possible abnormality, whether derived from the reported legal decisions or from other sources, against the evidence which he had heard. Having found the facts as stated, the commissioner should have acted on the medical evidence and should have granted a decree of divorce.

Parliament

The Minister and Registrars

EIGHT Opposition Members, including Dr. Charles Hill and Mr. Hugh Linstead, have tabled a motion in the House of Commons on the Ministry of Health's proposal to reduce the number of hospital registrars. The motion regrets the Minister's decision, announced in the debate on Dec. 15,[1] to proceed with the proposal during the Parliamentary recess, in view of the strong dissatisfaction expressed with the policy on both sides of the House. The recess began on Dec. 15, the day on which the debate took place, and continues until Jan. 23.

QUESTION TIME

Medresco Hearing-aids

In answer to a question Mr. ANEURIN BEVAN, the Minister of Health, stated that deliveries of 'Medresco' hearing-aids by manufacturers were averaging 8116 a month.

Hospital Registrars

Mr. M. C. HOLLIS asked the Minister whether, at his consultations with the representatives of the doctors concerning the issue of the circular on the reduction in the number of registrars in hospitals, the doctors agreed to the issue of that circular.—Mr. BEVAN replied: The circular was discussed in detail with the profession's representatives, and modifications were made to meet certain points they raised; but they did not feel able to agree with the final draft in every respect.

Diagnosis of Cancer

Brigadier FRANK MEDLICOTT asked the Minister if he was aware of the delay which occurred in many cases before persons suffering from cancer sought proper medical attention; and if he would take steps to make it more widely known that valuable remedial measures could be taken in many instances if the disease was diagnosed in its early stages.—Mr. BEVAN replied: I agree that the facts are as stated by the hon. Member. The Central Health Services Council has, however, recently advised that it is undesirable at the present time for any cancer publicity to be carried out by any central government organisation direct to the general public.

1. See *Lancet*, Dec. 23, 1950, p. 877.

In England Now

A Running Commentary by Peripatetic Correspondents

THE other week I attended the inaugural meeting of a local poetry society. I knew that all would be well directly my eyes fell on the instigator, a tall smooth young man with a luxuriant jet-black beard. He had two confrères, who were obviously accustomed to reading verse aloud in strong vibrant tones—and did. One of them embarked on a survey of English poetry, starting with Chaucer; the other read short extracts of poetry, as illustrations; I found the Chaucerian rhythms most attractive.

Besides these three and myself, there was the instigator's wife—a pleasant girl with nothing unusual about her—and a middle-aged civil servant with wife completed the party. The wife had no use for poetry; the civil servant had presumably brought her along because he did not want to leave her at home. He said that poetry had always been a passion of his and volunteered to read some; the poem of his choice was: "Tell me not in mournful numbers." He read it with dignity, explaining the more ambiguous portions. What a bad poet Longfellow is, and how poorly he expresses himself. For example, is the poet telling us that life *is* an empty dream, or merely that he does not want to be told so in mournful numbers?

When the civil servant had finished, the bearded instigator, out of sheer devilment, volunteered to read Eliot's *Sweeney Agonistes*. It was read with tremendous gusto—gusto is the only word which adequately describes his huge joy in the presentation of this remarkable poem. His two confrères joined in the chorus, which, you will remember, is all about bamboos. I enjoyed it tremendously, though why "I did a girl in; I did a girl in," is considered to be a line of poetry I find it difficult to understand. The civil servant said he did not like Eliot (I am sure his wife, too, failed to appreciate *Sweeney Agonistes*). At this stage I was asked what I would like to read, but I firmly refused to read anything at all.

The setting was in keeping with the proceedings—a small front room in a suburban house . . . a few chairs (some garden chairs) and two bookcases . . . a cubist design over the fireplace . . . a few geometrical figures on one of the bookcases, made of springs, coloured wire, and little spools . . . some "mobiles" in the hall . . . coffee (very good coffee, too) on orange-wood tray on floor . . . two siamese cats, wending their ways in and out among the chairs, climbing up to be fondled, and occasionally emitting strange hoarse cries. I shall certainly go again.

* * *

Those of us who did our "district" (practical midwifery to you) in London north of the Thames will remember the Regent's Canal as a useful landmark for locating obscure addresses and a source of simple entertainment during waiting periods. Glimpses of the canal can be had in a lot of unexpected places, but not until lately did I have an opportunity to traverse its full length by water. The master of a Diesel-engined "narrow-boat," normally trading in the Potteries, asked me to make the trip with him. I had wondered whether time-keeping would be as uncertain on canals as it is on the sea, and I was not left long in doubt. Our speed of progress largely depended on who won the races for the locks, and the master lived in constant fear that a small boy would bob up in a craft on the other side just in time to take possession of the lock.

The journey started in north Hertfordshire following the route well known to railway passengers from Paddington or Euston. The real crossing of London began at Paddington basin, a small tree-edged lake as quiet as a Thames backwater. For some distance after leaving the basin the canal follows a road from which I have often watched the boats pass, but now we provided amusement for others until a tunnel swallowed us up. One is conscious of being a source of free entertainment at various stages of the journey, but it is frankly humiliating when passing the Zoo to be stared at disdainfully by rows of cage dwellers, mostly standing on one leg, as if they are saying it is their turn now. Opposite power stations and factories you are just part of the everyday life and are passed on with a friendly wave of the arm.

The passage through the Islington tunnel has often

been described. The first thing to do is pray that you will not meet any other boat. All craft have a bow light, but ours was unreliable; so it fell to me to go forward 70 ft. and be ready with a torch for untoward happenings. A friend of mine who had flown to South America in the *Graf Zeppelin* once told me how he felt going along the cat-walks in the aircraft, but that was nothing to traversing what is termed the planking of a narrow-boat in semi-darkness.

The holds of narrow-boats, when filled, are covered to the full width of the vessel with a special form of ridged awning. Along the top of this ridge runs a springy plank 9 inches wide on which you may walk or crawl to the bows. With the torch-bearer safely on the tiny fore-deck we entered the tunnel. If you are looking for complete detachment from worldly cares try a trip up forrard through a long canal tunnel. One anxiously listens for the steady ponk-ponk of the engine, unbelievably far astern, because if it fails there is nothing for it but to pole through. The wet tunnel sides, sooty from tug smoke and diesel exhaust, make this operation much more unpleasant than it was before engines were introduced. The smoky lamp sheds its tiny circle of yellow light and all one can do is hope there won't be a crash with the walls or some other craft. Nothing happened in our trip except that I got increasingly stiff in muscles I did not know existed. Another lock was negotiated and we came to a region I used to know well, with almost forgotten street names which recalled vivid obstetric experiences of long ago. And not only obstetric experiences came to mind. There was the night of the street fight between two ticket-of-leave men who were always making trouble. There was the celebration when the birth of a much-wanted boy coincided with a highly successful day for the father at Doncaster races. Then there was the jemmy incident . . . but I digress.

London viewed from its canal becomes increasingly attractive the further east you go. Gardens run down to the waterside and many of them though small are most carefully tended. Then there is Victoria Park; how many Londoners living in W.1 or S.W.5 have ever seen it? Our cargo was loaded for a village in Essex approached by the Stort. For this reason we saw Victoria Park from a new aspect because the cut from the Regent's Canal to the Lea follows it closely. This short cut is tricky to navigate, and at one place we ran aground thoroughly, causing a delay which might have been serious because the short staircase of locks into the Lea, for some unexplained reason, is padlocked at 5 P.M. However, all was well and once in the Lea our progress northward was rapid. Darkness overtook us before we got very far; so my memories of the journey end, like an early cinema film, with a slow fade-out.

* * *

One of the patients at the skin clinic was a little girl with an inconspicuous spider nævus on her cheek. Her mother was a strikingly attractive woman. I asked about her husband's occupation, her other children, her home, her activities. I must own that these questions had more to do with my interest in psychosomatic factors than with the child's nævus, but she answered readily and vivaciously. At the end I was taken aback when she asked, "Well, Doctor, you have been asking me questions, do you mind if ask you a few?" And she did. Where was I born? Married? Children? How had I come to take up medicine? Was I happy in my work? That woman must have enjoyed her surprise counter-attack. Why have I never thought of turning on my inquisitors? There was that M.R.C.P. examination when a distinguished pædiatrician questioned me on what I considered to be an intricacy of his specialty. Why didn't I say, "All right, Sir, that is one up to you. Now, would you care to discuss the differential diagnosis of the premycotic stage of mycosis fungoides?" I suspect that his difficulties might have been as great as mine had been. Then there was the interview for an appointment in which I was asked what contributions I had made to dermatology. I might have replied, "The few projects I have in mind will take several years to mature. What original research have you done, Sir, in the last twenty years?" Which of us would have had more reason for embarrassment? But I am still going up for jobs, whereas this mother had nothing to lose.

Letters to the Editor

GENERAL PRACTICE

SIR,—Dr. Lennox Johnston's letter in your issue of Dec. 16 very feelingly emphasises the unsatisfactory state of general practice today. The growth of medical knowledge and techniques has made the general practitioner's surgery something of an anachronism; and the health service, with its offer of bounties to the patient, has made the practitioner the servant of the public in the wrong sense. This would not have happened if the practitioner had been able to offer himself in his true rôles of observer of diseases in its earliest stages, adviser on the maintenance of health and the details of treatment, and interpreter of specialist opinion. He has rarely the time to fill these rôles, and certainly if he has time he cannot make an adequate living in the National Health Service. The essence of the whole problem is time.

This can only be provided by protecting him from the patient who comes for some return for his weekly expenditure. We all hear too often: "I have to pay such-and-such a week, and I may as well have something for it"; and often this is not said but understood. The practitioner must also not be tempted to take on more work than he can do. Who can say No to more work and more money, especially in these difficult times?

We are loth as a profession to part with the competitive system because we feel it puts a man on his mettle; but I am not sure that this is true today. The salaried service has its dangers, but I feel we must ask ourselves which method now has the least evils. The problem is not easy, but I feel it is in need of urgent attention if general practice is to be saved and the practitioner to regain his honoured place in society. I think there is no doubt that the community would be the worse without him, and I believe that if the monetary reward could be divorced from the total of patients we should all become better doctors. There appears to be a feeling that if we were not paid so much per patient we should become less sympathetic to our patients' troubles—as if much devoted care was not given before the Act to those who could never hope to pay. The qualities of sympathy and understanding are of the man and not the system.

Blackburn. FRANK LIVESEY.

THE CHANGING FACE OF SURGERY

SIR,—In his address to Westminster Hospital Medical School (*Lancet*, Dec. 9) Sir Cecil Wakeley shows great prejudice against the concept of whole-time clinical professorships. He is perfectly entitled to his opinion, but it is unfortunate that he should choose to express his disapproval to medical students with the use of fallacious arguments. We have no means of assessing what work Lister would have done as a whole-time clinical professor, any more than we know what John Hunter's output would have been as professor of pathology at Oxford. These men did their work because of the urge to do it, and not for financial reward. Provided the time in which they lived was not one of oppression towards all original work, these men would have been notable whether as whole-time or part-time professors. The man can be superior or inferior to the appointment he holds.

It is equally wrong to suggest that the whole-time clinical professor of surgery must be cut off from the general practitioner. In quite a few universities the whole-time clinical staff have the option to do domiciliary consultations (but of course do not receive a fee). If the whole-time professor declines to do domiciliary consultations, that is a loss for the individual and not a fault of the system.

No system is perfect, and the criticism that a part-time professor of surgery might be out of touch with the laboratory is just as valid as that the whole-time man might be out of touch with the general practitioner. In both cases the opportunity is there. As yet it is much too early to decide whether whole-time clinical chairs produce a higher standard of work—after all it is only about ten years since the ins itution of such chairs in any university. The president of the Royal College of Surgeons has a great responsibility, and his opinion rightly carries great weight. It is therefore most disappointing that he should be so damning towards an experiment which has only just begun.

Department of Surgery,
Medical School, Dundee. JOHN GRIEVE.

SALICYLATE AS AN ANTICOAGULANT

SIR,—Dr. Gibson's letter of Dec. 9 prompts me to refer to the article[1] in which he recommended a combination of aspirin with ascorbic acid and tragacanth as an anticoagulant in coronary thrombosis and angina of effort.

There are some rheumatic patients whose treatment is complicated by attacks of phlebitis, with or without obvious thrombosis. In these cases Dr. Gibson's formula is most valuable, as it not only prevents thrombosis but also relieves the rheumatism. As Dr. Gibson points out, when the mixture is given with food there is no gastric disturbance.

London, W.1. H. WARREN CROWE.

PHILOSOPHY OF CLINICAL MEDICINE

SIR,—In his lecture on the psychosomatic approach to clinical medicine, Dr. Ranyard West[2] raises important questions and suggests an answer. Most people will agree that when the same patient can be treated with kaolin on Thursday and by a psychological probe on Monday, clinical medicine has reached a state of theoretic confusion and of therapeutic chaos. In this note I suggest that the cause of this state of affairs is that clinicians are over-simplifying the clinical situation and therefore failing to make necessary distinctions in clinical diagnosis and treatment.

The practical usefulness of the psychosomatic approach is not questioned; but we must ask whether that approach does not break down in practice, at the same point at which physical and psychological medicine break down—namely, when "the clinical case" transforms itself into a "living person." A person is not a hyphenated body-mind, of which fact Dr. West is aware when he writes: "it is often the patients rather than their doctors who succeed in adapting themselves to two conflicting philosophies of medicine." How does it happen that patients can reconcile, without instruction, incompatible opposites that defy the best minds in our profession?

Sherrington has shown *where* the integration of these opposites is achieved; even if he has not stated clearly *how* that integration is achieved. It takes place "in experience," in the process of living. Life psychically experienced and life physically experienced become "one life and one experience" in the awareness of the self that he is in fact an enduring entity, an "I." It has been objected that few people are aware of their continuing self-identity; but, as Sherrington says elsewhere, this is due to the nature of conscious mind which has been evolved to meet practical situations and not in the interests of self-awareness. The mind is able to attend "to only one main task at a time."

It seems then that, as clinicians, we may be taking the "self as a unity" for granted, and studying only the "self in its manifoldness"—i.e., its organs, functions, cells, and complexes. Hence we have failed to grasp the clinical significance of those diagnostic factors and those therapies whose value depends upon their origin in, or their effect upon, the unity of the personality. A. N. Whitehead has said that the problem before philosophy is to provide a satisfactory doctrine of personality and of the facts of the continuing self-identity of the organism. Doctors face this problem as a need for a coherent theory and practice of personality diagnosis and therapy.

W. D'Arcy Thompson and his school make the same point. Having demonstrated the significance of the *form* of the living organism in all biological theory, they have shown that the form (i.e., the self-identity) of the organism largely determines the particular shape that the organism will assume, at each stage of its life-cycle. C. G. Jung makes the same point—as is well brought out by J. Jacobi in her study of Jung's work. By insisting upon the significance of the "formal" causes of mental behaviour as well as upon the "efficient and final" causes of it, Jung makes an important practical distinction. Some students of Freud hold that the doctrine of the super-ego, if followed to its logical conclusions, leads in a similar direction. The increasing importance attached to "purposes, life-aim and life-styles" by other psychologists reveals a similar trend. Many general practitioners are realising that the "disorders of personality" are of great practical importance in clinical medicine in general, and in the preventive diagnosis of illness in particular. It seems reasonable to suggest, therefore, that a concerted attempt should be made to separate the "formal" or "personality disorders" (together with their clinical antecedents and consequents) from the many syndromes, &c., that have been distinguished hitherto solely by paying attention to disorders of the "manifold"—i.e., the psychosoma, or the body, or the mind (when this has been viewed as an "organisation of instincts").

Following this line of thought, some of the more obvious disorders of personality—sometimes called disorders of "attitude" can be indicated:

1. There is a large clinical group of patients who manifest "syndromes of despair." The basic psychology of this group was discussed by Kirkegaard many years ago. In practice three clinical varieties of this syndrome can be distinguished: (*a*) the "despair of ever becoming an individual," which is the commonest personality disorder of the young; (*b*) the despair of ever becoming a self (i.e., an integrated personality), which is the commonest personality disorder of those under, say, 35–40 years of age; and (*c*) the despair before death (also called the eternal despair) to which Dr. West seems to refer when discussing the "death-acceptance instinct" and which, as Jung insists, is the psychological disorder par excellence of middle and later life. All of these despairs are unconscious. Whenever they are made fully conscious, they are in a fair way to being cured, as a rule.

2. The major syndromes produced either by an arrest or by a repression of normal personality evolution are also well recognised. They are accompanied by recognisable effects and by certain peculiar disturbances of the normal "awareness of self-identity," and of the normal awareness of reality. Examples of the personality "regressions" are to be found in every mental hospital.

3. Again certain critical ages in the normal evolution of the personality are recognised. These are age-periods during which arrest or repression are most liable to occur, and they mark periods of transition from one stage to another in the evolution of the integrated personality from its early antecedents in the innate character of the infant. Childhood, adolescence, maturity (about 35), and middle-age are the dangerous ages in the evolution of the personality. If we agree to call the "innate form of the infant" by the name "character," then the integrated mature personality may be said to be the "form of the mature adult," and so on. In this sense character is innate, while personality is in part determined by innate qualities, and in part by experience.

All attempts hitherto made to isolate a group of basic instincts, complexes, or sentiments, capable of

1. Gibson, P. C. *Lancet*, 1949, ii, 1172.
2. West, R. *Ibid*, 1950, i, 1025.

serving as a sound theoretic basis for the diagnosis of personality, seem to have proved unsuccessful. The same is true in the field of social psychology where the hopes raised by Pareto's original analysis seem to me to have faded. Similar failures attended the efforts of the old faculty-psychologists and of the system-physiologists (as J. S. Haldane insisted). I suggest, then, that all of these failures have arisen from the same cause—namely that attention has been concentrated exclusively upon the manifoldness and not upon the unity of the self, upon the psychosoma and not on the personality.

On the practical side, this new approach to medicine offers the clinician the help of a number of "therapies of personality" (as the Americans term them). At one extreme those include suggestion, prestige-therapy, and the morale therapies. They include also a wide variety of therapies by occupation, by arts, crafts, and play, also some new group and social therapies that are now being actively studied; and, of course, education, persuasion, and other methods of personality healing. Finally there is a group of therapies of which more may be heard in the future—namely, various specifically religious therapies all of which call for careful study by clinicians.

The importance of revising medical theory and practice in the direction here proposed can hardly be over-emphasised. The new approach will be found to complete, rather than compete with, established clinical methods. If I am right, it will clear up the prevalent intellectual muddle, enable the general practitioner and the specialist to work together towards a single end, open up new avenues in therapeutics, and bring medicine into line with recent advances in biology and philosophy.

Worcester. HOWARD E. COLLIER.

CEREBRAL PALSY

SIR,—I am sure that no articles which you have published have contributed more to the understanding of each disease as a problem affecting all aspects of the patient's life—physical, psychological, social, and financial—than have those in your excellent Disabilities series. Of these, none has made a deeper impression on me than that on cerebral palsy (Dec. 16).

Here is a disability which is seldom treated by parents or friends with understanding; and no wonder, since even the neurologist may find difficulty over the details of diagnosis. It is perhaps because of this uncertainty as to the problem to be tackled that orthodox medicine has in the past paid so little attention to the final and, in the end, the most important question: What can be done? It is appalling that an adult woman should be able to report that only "within the last two years . . . I have benefited from specialised cerebral-palsy treatment." Previously, she had helped herself laboriously through inarticulacy to speech, and through uncontrolled movement to the achievement of functionally adequate, though slow and awkward, performance. Surely the fact that she has benefited from her recent specialised treatment suggests that an understanding of the nature of the *disability* may, with our present knowledge, form a useful basis of treatment.

This article can leave no doubt in the mind of any reader as to the possibility that a patient with cerebral palsy may yet be highly intelligent. It is a sobering thought that others, with less inspired parents, with only a little less intelligence or determination, or with a slightly more severe disability, fail in the struggle for lack of skilled help, to pass their days excluded from all society in a back room or incarcerated in a home for mental defectives.

Much is already being done, and local authorities are now obliged to provide for the education of every child capable of benefiting. But without highly skilled guidance such education can do little to make these children socially acceptable, and so will be largely wasted. Our aim should be to undertake treatment of these children from the first moment in infancy when abnormality can be detected, when their adaptability is greatest, so that as many as possible may, by school age, be fit to go to normal schools without the disadvantages described by your contributor, and so that no intelligent child need exhibit unintelligibility, drooling, or others of the grotesque handicaps which often militate against social acceptance or employment.

So far only one hospital has undertaken, through a research unit and an advice clinic for parents, the difficult task involved. The value of its work, only now becoming appreciated, gives us a pointer to the future.

London, W.1. WILLIAM DUNHAM.

GERMAN MEASLES IN GIRLS' SCHOOLS

SIR,—Mr. Robinson (Dec. 16, p. 827) appears to have overlooked the possibility of one of his daughter's school-friends having a pregnant mother.

Silver End, Essex. J. W. NICHOLAS.

STUDY OF DELINQUENCY

SIR,—One sometimes doubts whether it takes two to make a quarrel, and I have no wish to offer myself as a protagonist, particularly as I some time ago published views which largely agree with Dr. Stott's. Thus: "The reliable report is based on painstaking, sometimes even tedious, collection of data. . . . There is no short cut. We have no crystal ball." [1] And: "Where the psychiatrist has insufficient time to study his cases and to interview the parents, the magistrate will be justified in considering that as good a guess may be made in the court room as elsewhere." [2] In the same paper psychiatrists are urged to follow up the results of their recommendations and to be prepared to modify the treatment after placement away from home. These and other points, such as the use of psychiatric jargon and loose terms, and many more not mentioned by Dr. Stott, have been dealt with in lectures for some years. I find having made a lot of mistakes a good basis for teaching.

I would, however, like to take up the point made by Dr. Stott (Nov. 25) about treatment being too "clinic centred." With this I agree, but he also says in this connection: "A refusal to treat, or a picking or choosing of our patients, will only damage our reputation among the magistrates. . . ." In my experience with both juvenile and adult court work, precisely the opposite obtains. The magistrates, and any other experienced workers in the field, know full well that in the present state of our knowledge only a proportion of seriously delinquent cases are amenable to clinic treatment. I believe magistrates simply want to know if a particular case will respond at home with help, or whether some other course must be taken. They will therefore appreciate a frank statement upon the matter; they do not these days expect the clinics to perform wonders with impossible material. Dr. Stott reports two hearsay cases in which clinicians refused to see cases which were "too bad" and "uncoöperative" respectively. This, as he reports it, sounds very shocking. But if the two clinicians had in fact declined to treat the cases in their clinics because they appeared unsuitable for such treatment, and if they indicated what other course should be adopted, then these ignorant clinicians might after all be quite sensible people.

We are asked to "imagine what would be said of a family doctor who refused to treat a patient because he did not respond to his one and only prescription." But this is unduly difficult to imagine, because the training of family doctors (like that of psychiatrists) provides

1. *Probation*, 1949, 5, 286.
2. *Proc. R. Soc. Med.* 1948, 41, 201.

them with a range of treatment methods and encourages them to use inpatient or residential care when the illness is severe or the home deleterious.

Anyway delinquency is a big field and there is lots of scope for workers of different trainings to work together, as in fact they seem to do quite successfully.

London, W.1. PETER SCOTT.

RUPTURE OF ASCENDING AORTA

SIR,—Your issue of July 8 contained an interesting report, by Dr. Jokl and Dr. Mackintosh, of a case of rupture of the ascending aorta. I encountered a similar case at St. Alfege's Hospital, Greenwich.

The patient, a married woman, aged 24, was dead when brought to the hospital. The relatives stated that she was three months pregnant and had one child, aged 18 months, who suffered from heart trouble. At 11.15 P.M., after taking two glasses of ale, she went to the lavatory, where she collapsed. She was found unconscious and did not regain consciousness. When seen in the ambulance two and a half hours later, at 1.45 A.M., there was no sign of life.

Post-mortem examination showed gross œdema of the lungs with subpleural ecchymoses and on the left some interlobar adhesions. The heart did not seem enlarged, but the myocardium appeared anæmic; no abnormalities of the valves were noted. The ascending aorta was dilated, forming a wide aneurysmal bag; the inner coat of this section of the aorta was in places detached from the media. Two tears were visible, one penetrating to the adventitial tissue but not perforating, and the other leaking into the pericardium, which was filled with large blood-clots. The descending aorta was much narrowed, the circumference measuring only 2 cm. No signs of atheroma were found. The uterus and embryo corresponded to a pregnancy of eighteen weeks, the placenta and corpus luteum appearing normal.

I have to thank Dr. B. A. Young, consultant physician to St. Alfege's Hospital, Greenwich, for the details of the case, and for permission to report it.

Dresden, Germany. R. SCHEUER-KARPIN.

MASS RADIOGRAPHY

SIR,—Dr. Hoffstaedt's article of Dec. 9 is based on a fundamental misconception—namely, that "one unit can manage 25,000–30,000 miniature films a year."

Most units find it possible to make about 50,000 examinations annually. We are not surprised, therefore, that the units to which he refers appear to be so expensive. Unfortunately, in your leading article of the same issue Dr. Hoffstaedt's experience has been applied to mass-radiography units as a whole. Because a Durham carpenter bruises his thumb we see no reason why hammers should be withdrawn from the rest of the country.

You state that mass radiography is expensive. One of our units in south-east London has discovered 250 cases of active tuberculosis during a year, at a cost of £24 each. Surely early diagnosis is the most important facet of the whole tuberculosis problem, and should therefore be the last item on which to economise. You further claim that often a number of people are found to have tuberculosis, already cavitating, who a few months or *weeks* before gave a normal radiograph in a mass survey. Is there statistical evidence to put mass radiography out of court on this point?

You suggest that mass radiography should be applied only to certain selected groups where a higher proportion of positives can be expected than in the general population. Of the groups you list, school-leavers have an exceptionally low proportion of active tuberculosis—0·15% of 500,000 examined. School staffs, others in contact with children, prospective employees, and women attending antenatal clinics will give no greater yield than others in equivalent age-groups in the population at large. Those with a dust hazard, chronic sick, suspects referred by doctors, and contacts, though producing a higher yield, will do little more than whet the appetite of a voracious unit doing 50,000 examinations in a year. For instance, there is a London chest-clinic area where 996 contacts were examined at the clinic in 1947, representing but two days' work for a mass-radiography unit. Much time may be wasted in organising surveys for small groups. We believe that the main emphasis should be on volunteers from the general population.

F. D. BEDDARD
F. J. H. WALTERS
Medical directors, mass X-ray units, South-East and South-West Metropolitan Regional Hospital Boards.

MEPHENESIN IN PSYCHIATRIC CONDITIONS

SIR,—Mephenesin ('Myanesin') was originally introduced as a muscle-relaxing agent during anæsthesia, being administered intravenously for this purpose. Subsequently, it was found that it produced muscular relaxation in certain spastic and hyperkinetic disorders associated with a variety of neurological conditions, and that it was possible to obtain this effect by oral administration. During the clinical investigation of the neurological properties, it became obvious that it also exerted an effect in the psychiatric sphere, the therapeutic response obtained in cases of anxiety and depression being very marked.

Schlan and Unna[1] treated 63 patients suffering from anxiety states, acute and chronic psychoses, alcoholism, and drug-addiction. The dosage of mephenesin was 0·5–1·5 g. four times daily by mouth. Patients suffering from anxiety obtained relief within one hour of administration, and this persisted for not less than two hours. Beneficial effects, particularly the abolition of gross tremor, were also observed in cases of prolonged alcoholic intoxication. In cases of addiction to morphine and heroin, mephenesin was found to alleviate withdrawal symptoms, such as nausea, leg cramps, and vomiting, most successfully. It frequently produced normal sleep in patients whose disturbed psychic function had been causing insomnia. Henneman et al.[2] believe that it acts by raising the threshold of internuncial neurones in the spinal cord and brain stem.

It is with the object of making the valuable properties of mephenesin more widely recognised that the following cases are reported.

CASE 1.—A 47-year-old male dipsomaniac was given 'Myanesin Elixir' (B.D.H.) to relieve tremor. Two weeks after he left the nursing-home I was called suddenly to see him by a member of his family, the impression being that he was suffering from the effects of alcohol. He had, in fact, taken an 8 oz. bottle of the elixir on each of three successive days: his speech was slurred, his movements were awkward and clumsy, and he was mentally retarded. He was almost incapable of standing, and had to be supported when walking. His reflexes, pulse, and blood-pressure were not appreciably affected. He subsequently found that in therapeutic doses mephenesin effectively relieved him of his craving for alcohol.

CASE 2.—A 44-year-old woman who had attempted suicide suffered from intractable restlessness and insomnia. Paraldehyde made her violently sick and had to be discontinued: many other hypnotics were equally ineffectual. 1 oz. of myanesin elixir was prescribed preceded by 'Tuinal' gr. 3 thirty minutes earlier: this combination produced refreshing sleep for ten hours.

CASE 3.—A 35-year-old man, in receipt of a 20% disability pension for psychoneurosis, suffered from epileptic fits which did not respond to anticonvulsant or other drugs. Myanesin elixir was prescribed, in doses of 1 oz. when the aura of tingling developed down the left side of the body, merely in an attempt to relieve the intensity of the fits. Since the first dose there has been no recurrence of fits, now extending over a period of several months, during which time he might have been expected to have had dozens.

1. Schlan, L. S., Unna, K. R. *J. Amer. med. Ass.* 1949, **140**, 672.
2. Henneman, E., Kaplan, A., Unna, K. R. *Fed. Proc.* 1949, **8**, 301.

CASE 4.—A woman of 34, with a grossly unstable personality, was subject to hysterical outbursts of manic intensity. She was instructed to take myanesin elixir (1 oz.) when she or her husband felt that an attack was impending. This has been completely effective. She describes the effect of mephenesin as similar to mild intoxication: she is "knocked out" for a couple of hours, after which her aggressive episode has passed. Her entire personality has changed since her outbursts have been controlled. She has become psychologically accessible, less inhibited, more objective in her outlook, and a happier person.

CASE 5.—A man of 52, who had been invalided out of the Army on account of myocardial degeneration and hyperthyroidism, applied unsuccessfully for a pension. Two specialists decided that there was no evidence of the disabilities on account of which he had been discharged from the Forces, but when they identified an anxiety state he became very apprehensive. Anxiety attacks, characterised by trembling, palpitation, giddiness, and fear of collapse, occurred almost daily, and he became unwilling to go out of doors except by car. Myanesin elixir was prescribed, after sedatives had failed to effect any improvement, and the severity of his attacks was immediately reduced.

I should like to express my thanks to the directors and staff of the British Drug Houses for their coöperation in this work.

London, W.1. ELLIS STUNGO.

DOORMATS FOR OPERATING-THEATRES

SIR,—It has often struck me that the amount of contamination introduced into the operating-theatre on the soles of nurses', surgeons', visitors', and porters' feet must be quite considerable, and I venture to suggest that a certain amount of antiseptic cleansing of the soles of shoes and wheels of trolleys could be achieved if a sunken, floor-level, padded mat, soaked in a suitable antiseptic, could be placed at the common entrance to an operating-theatre suite.

Anyone passing over this mat would automatically coat the soles of his shoes with a thin layer of antiseptic, in the same way as "foot and mouth" traps are situated at certain frontier posts in Europe.

Buckhurst Hill, Essex. BERNARD KAPLAN.

HEPATIC ABSCESS ASSOCIATED WITH SCHISTOSOMIASIS

SIR,—I have only lately had the opportunity of reading the article on this subject by Dr. Graham and Mr. Orr.[1]

Infestation of the liver by schistosomes has been recognised for a long time. In 1933 Bourguignon, in Elisabethville, showed me some beautiful photomicrographs of adult worms and eggs in the liver.

The population around this hospital shows an infestation-rate of 15% with *Schistosoma hæmatobium*. This is after a single examination; repeat examinations would give a considerably higher rate—possibly double.

Palpable livers are common, both in small children and in adults. In almost all children with palpable livers schistosome eggs can be found by repeated urinary examinations. In adults enlargement of the liver is commonly accompanied by enlargement of the spleen and ascites. These cases usually terminate fatally in a few years or less. Sometimes the liver has become shrunken and cirrhotic before death; in such cases schistosome eggs can often *not* be found in the urine, but cystoscopy often reveals extensive damage of the bladder wall. I conclude that either the worms have died or that the extensive cicatrisation prevents the escape of the eggs.

On the other hand, liver abscess from any cause is rare here. I have seen only 2 instances in 120 autopsies and in a large number of explorations either by operation or puncture. The suggestion by Graham and Orr that in their case the abscess was caused by auto-infection of a necrotic area appears to me very probable. They are to be congratulated on giving us a timely reminder of schistosomiasis as a possible cause of hepatomegaly and liver abscess.

Chibambo Mission Hospital, Elisabethville, Belgian Congo. PATRICK K. DIXON.

1. Graham, J. G., Orr, J. L. *Lancet*, 1950, i, 714.

STRIÆ CUTIS DISTENSÆ

SIR,—May I summarise some of the points arising out of this controversy?

(1) Striæ atrophicæ (I use this term because striæ may occur without any previous stretching of the skin) are an expression of damage to the skin.

(2) Sixteen years ago I thought that purple striæ atrophicæ were characteristic of Cushing's syndrome due to basophil adenoma.[1] I abandoned that view because they occur with adrenocortical tumours causing Cushing's syndrome, and disappear after removal of the tumour (Selye,[2] p. 170). Furthermore, there are typical cases of Cushing's syndrome with no striæ, in spite of rapid increase in weight. Spence demonstrated an example to the endocrine section of the Royal Society of Medicine on Nov. 22. A woman of 47, with a mixed Cushing's and adrenogenital syndrome due to adrenal cortical carcinoma, had a petechial eruption over her upper chest, neck, and arms, and yet had no striæ atrophicæ. Her excretion of urinary 17-ketosteroids was 42·5 mg. per 24 hours. Only 4 weeks ago I saw a case of the pituitary type without any striæ in spite of an increase of a stone in weight within 4–6 weeks at the beginning of the illness.

(3) Patients may develop purple striæ in association with pleural effusion, pulmonary tuberculosis, pneumonia, asthma, dysentery, or tonsillitis; and even without any signs of illness [3–8] (e.g., three cases reported by Hurford and Snell [3] and one by Parkes Weber [5]). In Parkes Weber's patient they were present from 1934 to 1942, although the girl remained in good health (see Romer [7]).

(4) Cases of chronic malnutrition sometimes develop such striæ.[9 10]

(5) Overdosage with 'Cortisone' or A.C.T.H. may produce striæ atrophicæ as well as hyperpigmentation, acneiform eruptions, hirsutism, rounded (moon) face, delayed wound healing, and flattening of keloid scars.[11] In the New York conference on A.C.T.H., Sprague [12] stated that the hyperpigmentation resembles that of Addison's disease. Behrman and Goodman [11] accept Albright's view that the striæ are caused by thinning of the skin due to protein depletion. Selye [10] confirms that the same hyperpigmentation may be found in severe adrenal cortical deficiency; he says, "if systemic overdosage with cortisone may render the rat skin extremely atrophic and transparent, so do hypophysectomy and adrenalectomy"; finally, he finds it "suggestive to assume some interrelation between the characteristic striæ of Cushing's disease and the cutaneous atrophy which occurs in debilitated individuals, and after overdosage with cortisone or A.C.T.H."

(6) Purpura may occur as a result of damage to the capillary endothelium, with or without concomitant alterations in one or more of the factors concerned with blood-coagulation. It may occur in infectious diseases, after drugs, in cachectic states, in Cushing's syndrome, after overdosage with cortisone, or from mechanical causes (e.g., in pertussis).

(7) Of hyperpigmentation Selye writes, on p. 170 of his textbook [2]: "sometimes there is a melanoderma (in hypercorticoidism) reminiscent of Addison's disease. This may be either generalised or patchy; it is not due to secondary destruction of the adrenals since it can appear even in patients in whom only one adrenal is affected." It is "also noteworthy, though unexplained, that most animal species,

1. Medvei, V. C., Wermer, P. *Med. Klin.* 1934, **30**, 992.
2. Selye, H. Textbook of Endocrinology. Montreal, 1948.
3. Hurford, J. V., Snell, W. E. *Tubercle*, 1943, **24**, 16.
4. Medvei, V. C. *Lancet*, 1950, i, 1174.
5. Weber, Parkes F. *Lancet*, 1935, ii, 885; Rare Diseases and some Debatable Subjects. London, 1947.
6. Crofts, N. F., Macrae-Gibson, N. K. *Lancet*, Nov. 18, 1950, p. 595.
7. Romer, C. *Ibid*, Dec. 16, 1950, p. 825.
8. Kok, D'Almero. *Ibid*, p. 826.
9. MacLeod, J. M. H. Cited by Hurford and Snell.
10. Selye, H. Physiology and Pathology of Exposure to Stress. Montreal, 1950; p. 728.
11. Behrman, H. T., Goodman, J. J. *J. Amer. med. Ass.* 1950, **144**, 218.
12. Sprague, R. G. Proceedings of 1st Clinical A.C.T.H. Conference. New York, 1950; p. 384.

unlike man, do not develop cutaneous pigmentation under the influence of hypocorticoidism, although pigment-formation in animals is dependent on the adrenal cortex and can be influenced by corticoids."

(8) The urinary corticoids are usually much increased in Cushing's syndrome and after overdosage with cortisone or A.C.T.H.,[13 14] but they appear to be decreased in chronic malnutrition and in Simmonds's disease (Selye,[10] p. 223). Besides, the "normal" values of urinary corticosteroids vary from 0·5–1·5 mg.[15] and 0·025–0·085 mg. per 24 hours[16] to 0·5–5·0 mg. per 24 hours (neutral fraction) and 0·3–3·3 mg. per 24 hours (water-soluble fraction).[17]

What does all this mean? Surely that the skin as a target organ responds to a variety of stimuli. In Hindus, melanoderma (even of the mucous membranes) is racial (genetic); in Addison's disease the skin often responds in man and becomes pigmented; the skin of the laboratory animal does not do so.

Patients with localised myxœdema of the skin over the tibia do not seem to have a general deficiency of thyroid hormone, for their remaining skin appears normal. In partial acromegaly only a small fraction of the skeletal system may be affected; there does not appear to be a general excess of anterior-lobe hormone, particularly of growth hormone.

Bauer[18] has been teaching for many years the "principle of triple safeguard"—that many traits and functions of the organism are dependent on and regulated by the proper coöperation of (*a*) the particular organ ("effector organ," *Erfolgsorgan*), now called "target organ"; (*b*) the endocrine system, and (*c*) the nervous system. He contends that many traits and functions should be regarded as complex biological mechanisms. They cannot be understood merely by considering single parts of the highly integrated system of individual constitution.

I do not think, therefore, that we are justified in assuming that striæ atrophicæ are *always* an indication of *excess* of adrenal cortical hormone. Selye puts it quite clearly in his book on stress[10] (p. 783): "Diseases of adaptation do not necessarily result from an absolute deficiency or excess of corticoids."

I shall end with a quotation from Bauer[18] (p. 54): "It is possible today to produce artificial acromegaly and gigantism in dogs by prolonged administration of pituitary growth-promoting hormone, and it is possible to produce dwarfism by removal of the pituitary or thyroid. It is impossible, however, to transform one canine race into another by means of endocrine control. An artificially produced giant dog is neither a St. Bernard nor a Great Dane."

London, S.W.3. V. C. MEDVEI.

CHANGES IN THE CENTRAL NERVOUS SYSTEM DUE TO ELECTROCUTION

SIR,—It is perhaps rather late to comment on an article published some sixteen years ago, but the hypothesis put forward then has found its way into at least one medical textbook.

Dr. Blake Pritchard,[19] writing on changes in the central nervous system due to electrocution, suggested that electrostatic forces play an important part in causing lesions in the central nervous system, and supporting this hypothesis by some calculations based on one impossible assumption—namely, that a charge of 0·2 coulombs can accumulate (if only for a short while) on the human body. This charge, concentrated on a body of the size of man, would correspond to a potential of roughly 10,000 million volts. In actual fact this is impossible, because the surrounding air would have broken down long before such a charge was accumulated and the potential reached. The conclusion therefore that a force of 4×10^{13} dynes, or some 40,000 tons, act on the body is not tenable.

Later in the article the kinetic energy is equated with this force which is dimensionally wrong.

Finally, the conclusion that a surface charge corresponding to "half an atmosphere pressure" leads to a decompression wave is untenable. The highest possible electrostatic surface-pressure in air is about 400 dynes per sq. cm., corresponding to a break-down voltage gradient of 30,000 volts per cm. This pressure is very small indeed—equivalent to the change of atmospheric pressure when jumping from a table to the ground (3 ft.). It cannot possibly lead to lesions inside the body.

One of the main reasons for writing this letter is to draw the attention of the medical profession to a useful field of joint research with physicists and possibly engineers.

Department of Electrical Engineering, University of Cape Town. H. D. EINHORN.

CENTRE FOR TUBERCULOUS STUDENTS

SIR,—Though such centres are well known abroad and though the need for such a centre has recently received recognition in the B.M.A. Report on Tuberculosis, there exists in this country no particular institution in which students with tuberculosis can receive medical treatment while continuing their studies. The British Coördinating Committee for Student Health * is organising a trust fund with the primary object of establishing such a centre; and the committee would, through the courtesy of your columns, like to invite donations large and small to this fund.

It is quite impossible at the present moment to set up a full-scale sanatorium treating students in all stages of tuberculosis. It is intended that the centre now proposed should cater for students already sufficiently recovered to be able to take advantage of the educational facilities that it is part of the scheme to provide. It is at this stage that occupational therapy—and for a student his education is occupational therapy—is of most help; it is at this stage that the present inability to continue his studies is most disheartening to the student; and, most conveniently, it is at this stage that the demand for skilled nursing is least. Even from the point of view of the treatment of tuberculosis in the non-student population, the centre is likely to prove an asset since the transfer of students to the centre from sanatoria would lead to the earlier freeing of sanatorium beds.

The arguments for setting up a centre especially for students apply not exclusively to those usually understood by that term, and for this reason it is intended to make the centre available to senior as well as junior members of universities and other institutes of higher education, to research students as well as undergraduates, to university and college teachers as well as those in statu pupillari.

All donations to the fund should be sent to one of us, c/o British Student Tuberculosis Fund, Tavistock House South, Tavistock Square, London, W.C.1. Cheques should be made payable to the British Student Tuberculosis Fund.

F. R. G. HEAF
C. R. MORRIS
ALAN F. ROOK.

13. Sprague, R. G., et al. *Arch. intern. Med.* 1950, **85**, 199.
14. Wilkins, L., Lewis, R. A., Klein, R., Rosemberg, E. *Bull. Johns Hopk. Hosp.* 1950, **86**, 249.
15. Shipley, R. A., Dorfman, R. I., Buchwald, E., Ross, E. *J. clin. Invest.* 1946, **25**, 673.
16. Vennings, E. H., Browne, J. S. L. *Ibid*, 1947, **27**, 79.
17. Robinson, A. Unpublished.
18. Bauer, J. Constitution and Disease. New York, 1942; p. 51.
19. Pritchard, E. A. B. *Lancet*, 1934, **1**, 1163.

* Representing: British Medical Students' Association, International Student Service, National Union of Students, Scottish Union of Students, British Tuberculosis Association, Joint Tuberculosis Council, National Association for the Prevention of Tuberculosis, tuberculosis group committee of the British Medical Association, Association of University Teachers, Two University Medical Officers, Association of Principals of Technical Institutions, and Association of Teachers in Colleges and Departments of Education.

REGISTRARS

SIR,—In all that I have read about the registrar problem there has been no mention of the junior hospital medical officer. Surely the original fault lay with the hospitals which competed against each other for junior staff by advertising all positions as registrar grades. This was inevitable when a house-officer post remained empty until it was re-christened "junior registrar."

The present problems might be solved by limiting the registrar appointments to those hospitals which could offer their staff (or selected members of it) either formal training or adequate free time for study. All other posts would be called house-officer or J.H.M.O.—the latter not being limited to a fixed period of years. The man who hoped to become a consultant could then trade his security for greater opportunities of training. If he failed at one stage or another he could remain in his specialty (although probably at a different hospital) as a J.H.M.O. but would have lost his privileged position. If there were a free interchange between the parallel hierarchies, there would be no feeling that the man who left the registrar stream could never become a consultant (although his chances would be less); that is, the selection would not necessarily be made at an early age.

Maudsley Hospital, London, S.E.5. JOHN RICH.

OCCUPATIONAL THERAPY

SIR,—In rehabilitation much has been said about the importance of returning the individual to a "work environment." In the case of a machine operator, this implies an industrial workshop where he can be engaged on some machine even though his efforts produce a quantity of material of insignificant economic value. It is in this direction that it seems a creative social function of rehabilitation may be lost.

The value of occupational therapy in rehabilitation is twofold: first, it stimulates interest; and secondly, it restores function and skill. An individual recovering from injury or sickness may on discharge from hospital be unfit to proceed at once to rehabilitation in the form of learning a new trade or recovering lost skill in his old occupation. In this condition, introduction to a well-equipped occupational-therapy department staffed by personnel with the right outlook may be a step of great importance. There he will see others with a great range of handicap working at one of twenty or thirty different crafts, involving the use of a variety of machine tools. According to the estimate made of his mental and physical condition, the occupational therapist, guided by physician or surgeon, may allow him to choose one or perhaps two jobs—one if that serves to stimulate interest and restore function, or two where one particular job has a major attraction of interest and the other restores function. Often, the interest aroused may be such that without noticing it the patient recovers a greater degree of general mobility than he had thought possible, or, in some cases, even wished for.

Many patients coming for rehabilitation have passed a somewhat drab and unimaginative life at the work-bench or in a circumscribed factory environment. To be returned as soon as possible to an industrial workshop may be to lose a great opportunity, almost as though the man was to be returned to blinkers and harness efficiently to draw the cart or tread the corn. In an occupational workshop he will see for the first time the range and number of small crafts to which his hand may be turned for sheer pleasure and joy in creation, perhaps with the added gratification of gifts for friends or furnishing for his home. His vision is enlarged, and when his recovery is complete or he is fit to proceed for training in a permanent occupation he has learned some craft which can provide a hobby for the rest of his life. He has been introduced to a socially creative experience. The factory bench will soon be reached again, but spare time should never again be lacking in pleasing occupation, and his work at the factory may thus prove less irksome. Whether this is so depends to a great extent on the personality of the occupational therapist and her power to instil enthusiasm at the beginning.

It seems that here is a thread in a pattern which might be for industrial workers compensation for dull routine and monotonous mass-production work. Suppose that at all schools there were well-equipped arts-and-crafts departments, and that in every community there were equally well-equipped centres under the care of experts—centres where materials and tools could be obtained and the work done in an environment and with the space lacking in the modern small house or lodgings. Here skills might be learned or continued from school. Mother, father, and children might collaborate or follow their individual lines. The injured or sick during convalescence might learn or develop skills in the occupational workshop and continue in the community workshop.

Stimulated on a national basis with strong community support, these centres might go far to restoring the sense of creative activity of the old craftsman, and assuage the unrest produced by repetitive work at dull routine jobs or semi-automatic machines—a factor of undoubted importance in producing industrial neurosis. These centres would provide an alternative to the pubs, the dogs, or the cinemas so often visited from sheer boredom. The immense difficulties in the way of achieving a development of this sort are realised, but perhaps now that rehabilitation centres and school workshops are being steadily increased in number the idea may merit study and more consideration be given to the creative social function of occupational therapy to offset work in an industrial atmosphere.

Farnham Royal, Bucks. M. E. M. HERFORD.

STETHOSCOPES

SIR,—There seem, curiously, to be very few clinicians able to give a simple and coherent account of the use of stethoscope. I have yet to see in any textbook a discussion of the relative merits of the diaphragm and bell types—although their makers must be well aware of the basic principles of the instrument.

It is well known that low-frequency notes, such as mitral diastolic rumbles, are best heard with the simple open bell endpiece; and that harsher high-pitched sounds are clearer when a diaphragm endpiece is used, or when a bell is pressed hard on the skin. The acoustic conduction system in the case of the chest consists first of the air-space separating viscus and thoracic wall, then a "diaphragm" made up of layers of muscles and skin, and finally the long air column terminating in the ear-piece. The situation might be visualised as someone listening to sounds coming from the other side of a room, with a thick heavy rug hung across the centre. Through such a rug the slow air motion accompanying a low-frequency noise would be clearly heard, particularly since the high frequencies would be largely filtered off by the lax "diaphragm." If the soft rug could be compressed, it would become harder and thinner, providing less resilience—hence providing less resistance to the passage of high-frequency sounds, and more to low-frequency sounds. A stretched rug would behave in the same way.

It appears that the diaphragm endpiece of a stethoscope accentuates the high-frequency sounds, not by any property inherent in the diaphragm, but rather by virtue of the compression and slight stretching of the soft

thoracic wall against the whole area of the diaphragm. In the case of the bell stethoscope, the higher-frequency response obtained by pressure is presumably due to stretching of the soft tissues per se.

We may conclude that unless the diaphragm endpiece is being used merely to hear something from a chest wall emaciated in such a way as to make it impossible for a bell to lie flat, it should always be pressed down firmly ; otherwise its object will be defeated.

With regard to the flexible tubes of a stethoscope, there seems to be no virtue in a very large internal diameter. However, there are two reasons why the tubes should have thick walls. First, the instrument must be robust ; and second, the thicker and less resilient the wall, the less extraneous noise will be heard. Apart from the room noise heard from ill-fitting earpieces, most noise comes in via the fairly extensive "membrane" of the flexible tubes. There is thus a distinct advantage in making the wall as thick and stiff as possible, and it is for this reason that tough plastic tubes may have a good claim for consideration.

It would be interesting to know if any of your readers can make any addition to, or comment on, this analysis.

University College Hospital, London, W.C.1. C. J. DICKINSON.

TYPHOID FEVER IN A GENERAL HOSPITAL

SIR,—In his letter of Dec. 2, Dr. Grant takes two workers to task for treating a case of typhoid fever in a large general hospital. In your issue of Dec. 16, Dr. Michael Curtin, registrar in the hospital for infectious diseases of which Dr. Grant is medical superintendent, describes a case of subacute bacterial endocarditis treated there for five months. Is it partly because the beds in isolation hospitals are being used for non-contagious conditions that the failure to find accommodation for pulmonary tuberculosis has become a "national scandal" ?

Newcastle upon Tyne. H. A. DEWAR.

TOWARDS SAFER MILK

SIR,—Your annotation of Oct. 7, describing the area eradication scheme for dealing with tuberculosis in cattle, says :

> "Immediate slaughter of all reactors is not feasible, because it would cause a disastrous fall in milk-supplies and serious disturbance of farm economy ; the cow plays an important part in maintaining soil fertility, and some replacement stock must be bred from the tuberculin-positive."

This complacent condonation of the use of reactor cows for liquid milk production rests on two false premises. First, farmers are really worried about the flooding of the liquid-milk market, and it is common knowledge that much milk from attested herds goes to the manufacturing market. The fear of a milk famine is therefore ridiculous ; and even if such a fear was justified I am sure few mothers would not welcome a return to rationing rather than subject their children to the risk of tuberculosis. Secondly, it is nonsense to fear the lowering of soil fertility through the lack of cowdung. Many farms carry no livestock at all, and a simple alteration of soil management would obviate any loss of fertility due to the absence of dung.

The Government's proposal to compensate farmers for the slaughter of reactors is a scandal, since the best farmers have already cleaned up their herds and only the sluggards or the unscrupulous continue the production of milk from reactors. Reactor cows still form the backbone of the business of a type of dealer and farmer who should never be allowed to handle human food (except for their own use). I have personal knowledge of such a man who keeps a tuberculin-tested cow for his own use and sells milk from a cheap herd of reactors.

If every reactor cow was suitably branded, farmers would not dare to keep them openly, and the waiting-lists for sanatorium treatment would be lessened by removal of all cases of bovine tuberculosis.

Llandinam, Mont. HARDY NAYLOR.

*** We have long urged that all except the highest grade of designated milk should be heat-treated before distribution. Though, on the present policy, eradication of tuberculosis in cattle will not be achieved for something like fifteen years, this is a shorter time than other countries have taken over the task. Payment of compensation to farmers who would otherwise be deprived of their livelihood seems to us essential.—ED. L.

TROPHIC AND TROPIC

SIR,—In "thyrotropic" and kindred words the adjective τροπικὸς forming the suffix is derived from the passive voice of the verb τρέπειν, which has the two meanings of to "turn oneself towards" and to "betake oneself to."

> ποῖ δῆθ' ὁ τλήμων τρέψομαι ; τίνος ξένων
> δόμους ἔσειμι τῆδ' ἐπ' αἰτίᾳ φυγών ;
>
> Eur. Hipp.

> Where shall I turn me ? Think. To what friend's door
> Betake me, banished on a charge so sore ?
>
> Gilbert Murray.

The heliotrope turns itself towards the sun : the thyrotropic hormone betakes itself to the gland. For the use compare the well-known epithet of Odysseus, πολύτροπος (polutropos), "versatile" ; or the name of the Fate Ἄτροπος (whence atropine), "Inexorable." To say that a hormone betakes itself anywhere is not precisely accurate, but it is an allowable figure of speech : in fact it is a trope.

Professor Burn's substitution (Dec. 9) of trophic for tropic, from τρέφειν to rear, will hardly do, for the notion of nourishment is implied, whereas a hormone stimulates growth without contributing nourishment. An adjective denoting "furthering growth" is βλαστικός (blastikos). "Thyroblastic" proclaims in one word that "it exerts a most important influence on the development of the thyroid gland."

Orpington, Kent. H. ST. H. VERTUE.

SIR,—May I venture to question Professor Burn's assertions on the meaning of the suffix "tropic."

The verb τρέπειν, from which τρόπος is derived is a transitive verb (Latin : vertere), not intransitive as implied by Professor Burn. Admittedly, used in the middle voice it carries the meaning which he attributes to it, but basically it means "to turn (something), guide, or direct." In the spirit of free translation so common in scientific terms, "adrenotropic" and "thyrotropic" can quite legitimately be interpreted as "guiding or directing the adrenal or thyroid," a more accurate description of the action of these hormones than "nourishing," which function they obviously do not perform.

Etymologically, "geotropic" and "heliotropic" can be regarded as implying that the earth and sun respectively are responsible for the directing or are themselves being directed. Although the scientists may not mean this, it would be folly for us to base the application of this and other suffixes of classical origin upon existing inaccurate English usage.

Sheffield. H. H. PILLING.

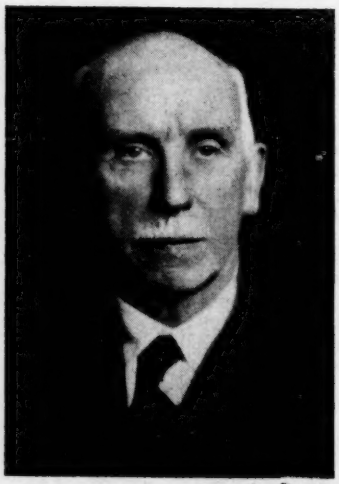
Obituary

LEONARD GREGORY PARSONS

KT., M.D. LOND., F.R.C.P., F.R.C.O.G., F.F.R., F.R.S.

Sir Leonard Parsons, emeritus professor of child health in the University of Birmingham, was a prophet who was not without honour in his own country. But his name was almost as well known in Canada and the United States as it was here, and pædiatricians all over the world will share in our loss.

From his earliest years he belonged to the Midlands, for he was born at Kidderminster and educated at King Edward's Grammar School, Aston, and at Birmingham University. After qualifying in 1903 he held resident posts at the Queen's Hospital in Birmingham and spent some years in general practice before taking a house-appointment at the Hospital for Sick Children, Great Ormond Street. In 1909 he took the M.R.C.P., and in the following year he was elected to the staff of the Birmingham Children's Hospital as physician to outpatients.



Stoneman

The hospital then had only 62 beds, whereas today there are over 300. Forty years ago the attention paid to the subject of diseases of infants and children was negligible, and the hospital was not associated with the medical school. Parsons set himself to promote the subject to the importance it warranted. Within five years his industry and enthusiasm had met its first reward and he was appointed to the specially established post of lecturer in diseases of children. Under his wise and thoughtful guidance pædiatrics began to figure more prominently in the training of students.

During the 1914–18 war Parsons served with the R.A.M.C. in Salonika. For part of the time he was attached to the Serbian army and in 1917 he received the Order of St. Sava. Soon after his return to civilian practice, he persuaded the medical faculty to approve the Children's Hospital for student instruction, and clinical classes were arranged. In 1929 he had convinced the university authorities of the importance of his subject, and when it was elevated to professorial status he was appointed the first professor of diseases of children in the university. During these and succeeding years, not only did he run a busy and exacting private practice but he continued to advance pædiatrics by teaching, research, and writing. His industry and enthusiasm were indefatigable.

The next major development in the university department was in 1934, when clinical clerking at the Children's Hospital was made compulsory for all students, and in 1943 Birmingham was one of the first universities to make pædiatrics a special and distinct part of the final examination. Meanwhile increasing knowledge of the diseases of children led Parsons to appreciate that prevention was as important as cure but was not receiving the recognition it warranted. He saw clearly that the gap between these two sides must be bridged, and in 1930 he inaugurated discussions with representatives of Birmingham University, the Children's Hospital, and Birmingham city council. The war interrupted progress, but soon afterwards negotiations were resumed and in 1945 an institute of child health was set up in Birmingham. This institute fulfilled Parsons's ambitions and ideals and fused into one whole all aspects of child health. The scheme he evolved was the first complete one in this country, and up to the time of his death he continued to be an active member of the council.

Side by side with the university department of pædiatrics, and again under Parsons's guidance, the Children's Hospital grew steadily in size, importance, and prestige. When the specially designed infants' division was started over fifteen years ago, he went to infinite pains in the study of the architectural design and gave inestimable help in rousing public opinion and raising funds for its erection. The building was finished early in the war but could not be fully used until 1944. In October, 1945, a special dedication ceremony was held, when the building was named the Leonard Parsons block. It will thus remain a memorial to his work for the hospital and for the children of the Midlands. A London colleague writes of the hospital under Parsons as a friendly place "where the visiting doctor was made to feel one of the circle of keen workers and brought away something of the spirit and enthusiasm he found there; for Parsons had fostered and developed a team spirit which was exemplified in the fine series of articles on the anæmias in childhood published under many names in the *Archives of Diseases in Childhood* (1933–35). He was a man we all trusted, a man of integrity and wisdom, who gave of his best and called the best out of others." His editorship in 1933, with Seymour Barling, of *Diseases of Infancy and Childhood* was another example of his talent for guiding a team.

Parsons was also an efficient administrator. For many years he represented his university on the General Medical Council, and from 1941 he was dean of the medical faculty. During the late war he was also a regional hospital medical officer for the Ministry of Health. From 1942 to 1945 he was president of the British Pædiatric Association, of which he was a foundation member.

But there was also Parsons the research-worker. The many official lectures which he was chosen to deliver were always something more than formal reviews, for they were warmed by his own knowledge and first-hand experience; and in these striking surveys he linked the work done in his own hospital with that done elsewhere. From the time when he gave his Goulstonian lectures in 1924, on the Wasting Disorders of Early Infancy, till his Withering lectures in 1947, on Nutrition and Nutritional Diseases, the deficiency diseases remained one of his greatest interests. Their elusiveness attracted him; for, as he once pointed out, "malnutrition is quite easily recognised by Members of Parliament and publicists, but clinicians find it difficult to diagnose." Stimulated by the work of his colleagues, W. N. Haworth, E. L. Hurst, and J. C. Drummond, on the synthesis of ascorbic acid, it was natural that he should make a careful study of the clinical applications of vitamin C, especially in relation to scurvy. Another of his chosen subjects was diseases of the blood, and in his Schorstein lecture at the London Hospital in 1938 he spoke on the Hæmolytic Anæmias of Childhood. As early as 1930 investigations into these anæmias were on foot in Birmingham, and the school played a large part in establishing that erythroblastosis is a hæmolytic disease. His interest in every new idea was instant, and in his Blair-Bell lecture to the Royal College of Obstetricians and Gynæcologists in 1948 he discussed the then novel theory of the influence of maternal rubella on congenital defects. But he steadily refused to lose sight of the wood for the trees, and in his Charles West lecture to the Royal College of Physicians in 1943 he once more insisted that pædiatrics is not a specialty, but general medicine applied to a special period of life. He also lectured much abroad. In 1931 he gave the Rachford lecture at the University of Cincinnati, and in 1941 the Blackader lecture to the Canadian Medical Association. In 1942 he was awarded the Moxon medal, and he was knighted in 1946. He was already a fellow of the Royal College of Physicians, of the Royal College of Obstetricians and Gynæcologists, and of the Faculty of Radiologists when he was elected to the fellowship of the Royal Society in 1948.

On St. Luke's day this year he was the Harveian orator of the Royal College of Physicians; he was one of the

new Lunar Society of the Air, whose learned and entertaining after-dinner conversation was broadcast last month; and a few weeks ago he gave the Harben lectures at the Royal Institute of Public Health and Hygiene. He died at his home on Dec. 17, at the age of 71, in the midst of a still busy life.

C. W. V. writes: "Those of us who knew Leonard Parsons intimately, whether on committees, in the wards of his beloved hospital, on examiners' panels, or in his own home, can appreciate his gentle, kindly nature, his wisdom, his wide sympathies, and his great love for children. His home life was supremely happy, and it was here that he obtained the inspiration and strength which helped him so much in his work. His influence for good touched many points, and perhaps the future will show that his most important work has been the integration of infant and child-welfare work with clinical pædiatrics, and his facility for striking the right balance between prevention and cure of disease in childhood. He was a simple, rather shy, Christian gentleman who will be mourned and remembered by friends all over the world, and there will be many parents in the Midlands who will bless his name."

"Thirty years ago," writes A. P. T., "walking from our hospital, Leonard Parsons told me that he had decided to devote as much time as he could to the study of disease in children. When I asked him why, he said there were two reasons. First, that he liked children, and, second, that he believed the problems of pædiatrics were likely to prove the most profitable to study while biochemistry and clinical pathology were in their infancy, because they were relatively simple in comparison with those of adults—and, he added with a laugh, he got on better with simple things. With infinite patience and perseverance he built up the research departments at the Children's Hospital, and the record of his achievement is witness not only of the shrewdness of his judgment but also of that rare power of sustained interest without which so many projects fail. But he never became a narrow specialist; he had a sense of the unity of medicine and knowledge that was wide as well as deep. His was not a quick or agile mind, but it was a very sure one, and he had the supreme gift of defining the essential. It was this and his integrity which brought him success as an administrator in his later years; men might think him wrong but they could not justly question his good faith. His example inspired the school he served so freely and so well, and honours did not spoil him; to the end he was a humble seeker after truth and always happy in the search. He had learnt the great lesson:

> From quiet homes and first beginning,
> Out to the undiscovered ends,
> There's nothing worth the wear of winning
> But laughter and the love of friends.

and he had his reward."

In 1908 Sir Leonard married Miss Ethel Mantle. She survives him with a daughter and a son, Dr. C. G. Parsons, who has followed his father as physician to the Birmingham Children's Hospital.

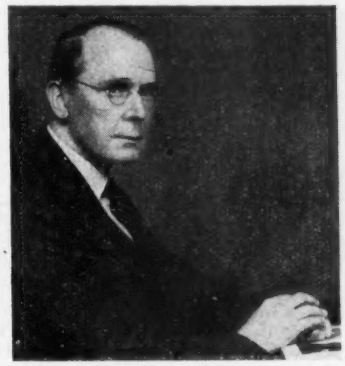
HENRY MacCORMAC

C.B.E., M.D. EDIN., F.R.C.P.

Dr. Henry MacCormac, consulting physician in diseases of the skin to Middlesex Hospital, died at his home in London on Dec. 12, at the age of 71.

He came of an old Belfast medical family. His grandfather, another Henry MacCormac, was said to know 20 languages and was one of the first advocates of the open-air treatment of consumption, which he held was often engendered by "pre-breathed air." His uncle, Sir William MacCormac, who was present at the battle of Sedan, practised as a surgeon in London and was five times president of the English college.

The younger Henry MacCormac graduated M.B. at the University of Edinburgh in 1903, and after postgraduate study in Paris was appointed assistant bacteriologist at Middlesex Hospital in London. Later he became medical registrar, and for a time he worked as an assistant in the cancer research laboratories. Here his growing interest in dermatology led him to study precancerous conditions of the skin, and in the reports of the department will be found his studies on the relationship of rodent ulcer with squamous carcinoma of the skin. In 1911 he was elected to the staff of the hospital as assistant physician, and he also became a member of the staffs of the Infants' Hospital, Vincent Square, the Seamen's Hospital, Greenwich, and St. John's Hospital for Diseases of the Skin.



Elliott & Fry

During the 1914–18 war he was consulting dermatologist to the British Expeditionary Force in France. Of this period H. W. B. writes: "He was fired by an intense patriotism and a passionate determination to convince the Army authorities of the enormous wastage of manpower from skin diseases, much of which, as we know now, could have been prevented by adequate prophylaxis and efficient treatment. In the end, aided by others, he succeeded. If, perhaps, he underestimated the importance of pyogenic infection secondary to pediculosis corporis, he conducted with Dr. W. D. D. Small an intensive campaign against scabies. He may be said to have made the Army scabies-conscious, and he took infinite pains to impress on medical officers the important diagnostic features of the disease and its complications; he described clearly the atypical varieties that might be encountered. It was, perhaps, an indication of his respect for tradition that the routine method of treatment he so strongly advocated and instituted was inunction with sulphur ointment twice daily for three days. He was, I think, the first to draw attention to the prevalence and seriousness of the miscalled 'seborrhœic' dermatitis, which was so important a cause of disability among our troops in France. This condition was then usually diagnosed as impetigo and treated as such—with disastrous results, because one feature of these cases was their intolerance of banal antiseptic applications, such as mercurials and sulphur. MacCormac taught me that calamine liniment was probably the best local application, at any rate during the acute phase of the eruption. He rightly pointed out that what I later termed the 'status seborrhœicus' aggravated the problem of scabies, partly because it favoured secondary pyogenic infection and infective eczematoid dermatitis, and partly because the patients were often in varying degree intolerant of sulphur ointment."

For his war services MacCormac was twice mentioned in despatches, appointed C.B.E. in 1919, and awarded the médaille de l'assistance publique. In 1917 he had been elected F.R.C.P., and in 1920 he became head of the skin department at Middlesex Hospital. In 1933 he was president of the dermatological section of the Royal Society of Medicine, and he also served a term of office as president of the British Association of Dermatology and Syphilology.

With his powers of observation and erudition he could, had he wished, have devoted himself to the more academic aspect of his subject and to research; but, although he made important contributions to literature, he preferred to concentrate upon dermatology as it affects the public welfare. He continued his campaign against scabies, gave a broadcast, which was characteristic in its clarity and simplicity, and with considerable difficulty had an excellent film made and produced to illustrate the essential points in the ætiology and prevention of the disease. Later he interested himself in industrial dermatitis, and in his appointment as specialist medical referee his exact legal knowledge, his logical outlook, and his passion for justice made his opinions invaluable. It is

related that "he would drive down to some outlandish factory to inspect the actual environment and conditions, in order to be perfectly just in his judgment on industrial dermatitis cases." For such expeditions he received no additional remuneration. Recently, in spite of failing health, he succeeded—again with great difficulty—in launching a film on industrial dermatitis, which was admirably devised and produced. Outside his professional and public activities, he had the cultured man's love and respect for history and tradition, and he delighted to revive interest in great figures of the past. He wrote a memorable account of Robert Willan, and was responsible more than anyone for obtaining greater recognition of his pioneer services to dermatology.

"Far more than most," H. W. B. continues, "MacCormac was influenced by a sense of public duty, which accounted for his almost fanatical zeal during the first world war and afterwards as a civilian. He strove, as others have done less successfully, to impress both the medical profession and the laity with the importance of certain common dermatoses in the lives and activities of the community. He was a man of impeccable—one might well say quixotic—personal and professional integrity. I have known him sarcastic and sometimes bitter when he met with frustration, injustice, or indifference, but he was incapable of meanness, unkindness, or selfishness. Serious to a degree when what he thought was right was impeded or neglected, he had an entrancing lighter side to his character. I have never had a more delightful companion. His sense of humour was of the more delicate, less obvious, kind; and he had—which is much rarer—a puckish appreciation of the comic, so that one of his treasured memories was that of Pelissier's 'Follies.' He was a very good mimic, and his mimicry revealed his knowledge of the racial or social mannerisms and foibles of his victims. As a host he was generous without ostentation, and on more formal occasions one could rely upon his detecting a humorous situation if there were one. His high courage, and his humour, remained undimmed either by physical suffering or by the disappointment he felt at being unable to continue his work."

Lord Moran writes: "Henry MacCormac was Ulster to the bone, and he had the qualities of good sense, forthrightness, and integrity, which we have come to associate with the North of Ireland, qualities softened in him by the graces of an old tradition. For his forebears had won distinction in medicine before Jane Austen began to write—perhaps even in this democratic age that is no disadvantage—and his grave and gentle courtesy with humble folk came from a day before men congregated in great towns, so altering life. He was a simple soul, unconscious of his worth, and when a signed copy of the *Gathering Storm* was sent to him, he treasured it and kept it always in his room; he was a man of strong loyalties, though his feelings seldom came to the surface. Men liked him for the reasons known to men, and long ago cries of 'Henry, Henry' would greet his appearance at the Savile Club, before he was taken off to the bridge room. In the branch of medicine which he practised he was a master, striving always to understand what was happening beneath the surface, for he was not a man to be content with labels; and in the business of the world his opinion was valued by the Royal College of Physicians, of which he had been a councillor and Lumleian lecturer."

In 1931 Dr. MacCormac married Marion, daughter of Mr. B. C. Broomhall, F.R.C.S., of Tai Yuan Mission Hospital, China. She survives him with one son.

SYDNEY WATSON SMITH

M.D. EDIN., F.R.C.P., F.R.C.P.E.

Dr. S. Watson Smith, a past president of the British Medical Association, died on Dec. 15. He studied medicine at St. Andrews before going to Edinburgh, where he qualified in 1903. Despite delicate health he insisted on giving up his Dundee practice during the 1914–18 war to serve with the R.A.M.C. On demobilisation he settled in Bournemouth, where from 1924 he restricted himself to consultant practice. He was chosen to preside over the B.M.A. when it met there in 1934. The editor of the *Book of Bournemouth*, he spoke and wrote sensibly on climatology; and in 1936 and 1937 he wrote constructively on the lessons to be learnt from the Bournemouth typhoid epidemic. He was the chronicler of the B.M.A. world tour which he led to Australia in 1935.

Public Health

Poliomyelitis

IN England and Wales notifications of poliomyelitis during the week ended Dec. 16 were: paralytic 82 (73), non-paralytic 25 (31); total 107 (104). The figures for the previous week, compared with which there was a total decrease of 3, are in parentheses.

Pest Destruction by Fog

The insecticidal fog applicator known as 'TIFA' [1] has been developed from the fog generators used in the late war. The makers claim that this apparatus, operated by one man, can fill 15,000 cubic feet of room space with fog in a minute, or blanket 30 acres of ground in an hour given favourable atmospheric conditions. The machine illustrated, mounted on a Jeep, was used in Sardinia during the malaria eradication campaign of 1947; it is shown fogging the cathedral church of Bon Aria, Cagliari. Various petroleum solvents make satisfactory fogging fluids, and to these may be added insecticides such as D.D.T., B.H.C., or pyrethrum; the droplet size of the fog can be adjusted between 0·5 μ and 200 μ. The power is supplied by a 6 h.p. Lister petrol engine, which drives a blower and pumps, and the machine will disperse 16½–53 gallons of insecticide per hour, according to the particle size adopted. The fog

Fog applicator in action.

applicators, with trained operators, can be hired by health authorities.[2]

One of these machines was used this summer in the Lincolnshire village of Cranwell at the time of the poliomyelitis epidemic, and Dr. J. Scholey, the medical officer of health, writes as follows:

> "Three houses in which cases had occurred were 'fogged' with a solution of D.D.T. with 0·1% of pyrethrum in kerosene. This was done by closing all the doors, and windows except one which admitted the nozzle of the machine. In a matter of about five minutes the house was filled with the 'fog,' which is delivered under pressure. The amount of insect life destroyed is quite surprising and most illuminating; a room which was comparatively free from flies and the like yielded scores of insects. Outside fly-infested places were then chosen, and were dealt with by delivering a fine 'fog' of 5% D.D.T. in kerosene. Ponds, drains and open sewers produced swarms of insect life which were all quickly destroyed. Here I think a word of warning should be issued, as the indiscriminate use of the machine over certain sewage plants which depend on insect life for their effective function could be definitely detrimental.
>
> "There is no doubt that the TIFA fog is a most effective means of destroying flies and other insects and extremely thorough and swift in action."

The machines are extensively used for public-health work abroad, some 52 being known to be operating in 46 different countries.

1. Todd Insecticidal Fog Applicator. Distributed by Lister-Todd Engineering Corporation Ltd., 15–19, Kingsway, London, W.C.2.
2. From Tifa Service, Chelsea Insecticides Ltd., 125, Pall Mall, London, S.W.1.

Notes and News

MANCHESTER REGISTRARS' MEETING

AT a meeting of the Manchester Region Registrars' Group on Dec. 1, Dr. R. M. FORRESTER, who was in the chair, said that the group had pressed for a proper consultant-registrar ratio; but registrars disagreed with the way the Minister of Health was proposing to achieve this. The professional body approached by the Minister had regarded his proposals as impracticable. Replacement of registrars by general-practitioner assistants could not be contemplated by hospitals, registrars, or the general practitioners themselves. Dr. Forrester mentioned the unsatisfactory alternative employment open to the 1100 displaced registrars. The most senior were to be the first to be dismissed; and neither the Armed Forces nor the Colonial Medical Service were attractive, as many registrars had already served in the Forces and many now had family responsibilities. Entry into general practice was extremely difficult for registrars. The Minister had stated that in drawing up his scheme he had not been influenced by the Treasury; and no saving would be effected by transferring registrars from the hospital service to any other medical service. Dr. Forrester put forward three proposals which might help to solve the registrar's problem: (1) moderate expansion of consultant services; (2) improvement of conditions in general practice; and (3) extension of the tenure of senior registrar appointments, whose length might vary with the openings in the consultant service. As long as a definite maximum tenure was laid down, there would be no blocking of new entrants.

Dr. T. F. REDMAN pointed out that such an extension would prolong the period of insecurity before the registrar knew whether he was to get a consultant post. He suggested, as an alternative, the creation of junior consultant posts. This proposal was criticised by some members on the ground that the services of a fully trained consultant would be procured at less than a consultant's pay. Members agreed, however, by 60 votes to 22, that the present emergency can be met as far as is possible by extending the consultant services, and by the creation, if necessary, of junior consultant appointments. A "junior consultant" was defined as a doctor to be paid at a salary intermediate between senior registrar and consultant, and with full clinical responsibility, who would have the right to promotion to full consultant status. Members unanimously adopted the chairman's statement of policy as the basis for future discussion and action; and they rejected by an overwhelming majority a motion "that the principle of increased tenure of senior registrar appointments does not commend itself as generally desirable."

AS TWO PATIENTS SAW POLIOMYELITIS

IT is worth comparing two books [1] written about themselves by sufferers from poliomyelitis. Gerald Webster gives a straightforward account of the life of a disabled person as it will no longer be lived, we may hope, in a Welfare State. He clearly had a hard time in Australia and England as a cripple child and young man; but even so the security he lacked was emotional rather than financial. It is a pity that he has not the capacity to describe his own feelings, as warmly as he does those of others. Very occasionally a phrase shines out from its context and momentarily lights up the scene, but for the most part the reader must use his own imagination to understand what the author does not tell. Bentz Plagemann evidently has far more experience in the art of writing, and can—almost too readily—give us his thoughts and emotions. He developed the disease as an adult, and not as did Mr. Webster in childhood. Yet for him poliomyelitis was almost incidental: half the book is an account of his life as a pharmacist in the American Navy during the last war; and he thinks that there may well be a connection between his response to that experience and the onset of the disease. Undoubtedly he seized it as a welcome escape from responsibility, and this is the crux of the book. The average poliomyelitis patient of his age is optimistic and cheerful, trying hard to get better; but this young man describes the famous Warm Springs settlement only as a place where one becomes acclimatised to disability. In the emotional conflict between his paralysis and its value as a refuge he has no energy left for recovery.

In both men, however, the dominant factor is the imperative need for security: not a financial or even a social security, but a true emotional security on which to base the new life. They convince us that the adult injured by poliomyelitis must first of all believe in the possibility of considerable recovery and work wholeheartedly for it, but that he must at the same time be willing to accept some makeshift and perhaps permanent compensatory movements. Then, in spite of even widespread paralysis, he may still live constructively. Even when Gerald Webster had won a degree of financial security, his future was by no means certain until he had learnt that a cripple can still be accepted as a man both by the world about him and by himself. The two books remind us that for those treating infantile paralysis the most important aspect of the patient is his mind, and its influence on recovery and reablement.

1. I Walked at Dawn. By GERALD WEBSTER. London: Allan Wingate. 1949. Pp. 255. 9s. 6d. My Place to Stand. By BENTZ PLAGEMANN. London: Gollancz. 1950. Pp. 241. 10s. 6d.

University of London

The title of professor of clinical pathology in the university has been conferred on Dr. Montague Maizels, reader in clinical pathology at University College Hospital Medical School.

University of Bristol

At recent examinations the following were successful:

Final Examination for M.B., Ch.B.—R. M. Barnes, Marianne A. Barry, Monica B. Bishop, K. A. Boulton, Luba Epsztejn, B. R. W. Evans, Hella R. Fluss, R. F. Harvey, M. E. Hincks, K. R. Kidd, G. A. Pilkington, J. F. Rowland, Rachel D. R. Sasieni, Mildred M. C. Shaw, D. T. I. Stuttaford, Ginette M. Tebbutt, P. A. Titterton, Patricia Vowles; and Harold Maxwell (in Group I, completing the examination).

D.P.M. (Part II).—J. A. Ardis, K. W. Aron, E. C. Turton.

University of Durham

On Dec. 15 the following degrees and diploma were conferred:

M.B., B.S.—Meryl A. Christian, J. A. Eykelenboom, J. R. J. Glavina, C. St. J. E. Harding, Marjorie Hepple, D. D. Hobbs, Shirley McTaggart, Brian Metcalfe, Shirley M. C. Nuttall, Lola V. Stafford, Anne W. Watts.

D.P.H.—J. F. McGarity.

University of Manchester

At recent examinations the following were successful:

Final M.B., Ch.B.—H. G. Arnall, R. B. Haigh, J. M. Midgley, R. E. Raworth, Gertrude H. G. Robinson (old regulations): Derek Ashworth, Margaret Bentley, Constance M. Bevan, J. C. Canney, E. H. Cooper, Donald Davies, Brian Didsbury, Jacob Ellis, G. R. Gates, Ronald Hinchcliffe, J. T. W. Howe, Geoffrey Howitt, T. R. Hunter, Arnold Hyman, J. E. Kench, J. H. Latchford, M. B. Raby, Carolyn C. Rigby, Kathleen M. Rushton, Janet Savatard, Harold Selcon, Lorna J. Shankland, Alan Sippert, Geoffrey Sullivan, D. W. Sumner, S. E. Sutton, Olive M. Thomas, C. F. H. Vickers, Margaret R. Walley, Brian Ward, G. R. Whittaker, David Wolman (new regulations).

D.P.M.—Zygmunt Finkelstein, L. G. Nicol, Margaret I. Platt, Susanne Shafar, T. P. Smith.

University of Edinburgh

On Dec. 15 the following degrees and diploma were conferred:

M.D.—E. D. Caldwell, T. M. Chalmers, E. N. Moyes, †C. Scott Russell, *J. T. R. Russell, †J. J. Stevenson.

* Commended. † In absentia.

M.B., Ch.B.—H. F. Acheson, W. D. A. Birch, G. Y. Cheyne, Phyllis Connor, B. S. Dorfman, I. A. Fraser, A. D. Gentle, John Grant, E. R. Henry, Brenda M. Johnson, Hazel M. Lazarus, Margaret E. Loudon, Alastair Macaulay, A. R. Manners, W. P. Mazur, J. A. Mitchell, P. T. Monard, Robert Renton, P. F. F. Rushforth, T. M. N. Salvesen, L. E. S. Sandison, G. A. Steele, J. F. Stephen, E. B. Tagoe, Nancy M. Tweedie-Stodart, Mary B. Watson, J. S. Whittaker, T. W. Wilkinson.

D.M.R.T.—J. D. Abbatt.

University of Sheffield

Dr. D. E. Price has been appointed honorary lecturer in pathology.

Royal Faculty of Physicians and Surgeons of Glasgow

Sir John Parkinson will deliver the Finlayson lecture to the faculty at 242, St. Vincent Street, Glasgow, on Wednesday, Jan. 10, at 5 P.M. He is to speak on Symptoms in Cardiac Diagnosis.

Institute of Neurology

A film will be shown at the National Hospital, Queen Square, London, W.C.1, on Friday, Jan. 5, at 5 P.M., of an hemispherectomy, performed by Mr. R. A. Krynauw, F.R.C.S.E., head of the department of neurosurgery, Johannesburg Hospital.

Caribbean Conference

The British Medical Association is holding, at Port of Spain, Trinidad, from Jan. 8 to 13, a conference at which Dr. Guy Dain will take the chair. Dr. Dain will be accompanied on his visit to the West Indies by Dr. H. B. Morgan, who will also speak at the conference.

Course on Rheumatic Diseases

A course on the chronic rheumatic diseases is being held at the rheumatism unit of St. Stephen's Hospital, Fulham Road, London, S.W.10, on Saturday and Sunday, March 3 and 4. Dr. Russell Brain, F.R.C.P., will give the inaugural lecture. Further details can be had from the medical registrar of the unit.

Cytology of Bacteria

A joint meeting of the microbiological panel of the society of Chemical Industry and of the Society for Applied Bacteriology on this subject will be held on Wednesday, Jan. 10, at 2.15 P.M., at 11, Chandos Street, London, W.1. Prof. R. J. V. Pulvertaft, F.R.C.P., will open the discussion.

W.H.O. and Alcoholism

A committee of the World Health Organisation's expert panel on mental health met in Geneva this month to discuss alcoholism as a public-health problem. According to the *New York Times* (Dec. 17) the committee has recommended that special clinics be set up in general hospitals throughout the world. It also urged the establishment of a world clearing centre for scientific information on the causes and cures of alcoholism.

College of Food Technology

After negotiations between the Ministry of Education, the Ministry of Food, and representatives of sections of the food industry, it has been decided to set up a National College of Food Technology in London about next September. Students will be drawn from the food industry at the age of 23 or over, to receive advanced training. The board of governors has been appointed by the Ministry of Education, and will include Mr. Frank Shires, of the Food Manufacturers Federation, as chairman, and Mr. John Hammond, F.R.S., reader in agricultural physiology in the University of Cambridge, as vice-chairman.

Sale of Peckham Health Centre

Subject to the approval of the Ministries of Health and Education, London County Council is shortly to acquire this centre, for the sum of £60,000. The L.C.C. education services are at once to have the use of the swimming-bath, gymnasium, and lecture-hall. Within the next two years an antenatal centre is to be set up in the medical rooms of the centre, and the ground floor is to be adapted for use as a day-nursery. Later it is planned to establish a general-practitioner health centre, maternity and child-welfare centre, and dental centre to serve 26,500 people, and a medical research unit. This full scheme will cost nearly £126,000. The new facilities will to some extent continue the work of the old Peckham Health Centre, but as it will not be in the original form it has been agreed that the building shall not bear the name of the Pioneer Health Centre or the Peckham Health Centre.

Payment of Advisory Appointments Committees

The Ministry of Health has announced in a circular (R.H.B. [50] 124) new arrangements for the payment of advisory appointments committees constituted after receipt of the circular. The Minister, this says, is of opinion that "it is not appropriate that members of these Committees should receive fees (bearing in mind that members of Boards themselves and their normal committees are not entitled to be paid fees)." Nevertheless these members should be able to claim compensation for any loss of earnings and for additional expenses, subject to the conditions applied to members of boards and their committees generally. The one exception is a consultant appointed from outside the region to serve on an advisory appointments committee in the case of a post at a non-teaching hospital, or on a joint advisory appointments committee set up where it is proposed to appoint the same person in both a teaching and a non-teaching hospital. This member may be remunerated at the rate of 7 guineas a day or 4 guineas a half-day provided that he is not drawing the full salary for whole-time employment.

Yorkshire Society of Anæsthetists

A meeting of this society will be held at 8 P.M. on Wednesday, Jan. 3, at Leeds General Infirmary, when Dr. Robert Cope will speak on Anæsthesia for Babies and Children.

International Exhibition of Medical Arts

This exhibition and a series of international medical and surgical meetings will be held at Turin from May 30 to June 21 under the auspices of *Minerva Medica* and the Italian Medical Association. Further information may be had from Prof. S. Teneff, Palazzo delle Esposizioni al Valentino, Torino, Italy.

Sir Gordon Gordon-Taylor has left London on a four weeks' visit to Pakistan arranged by the British Council.

Copies of the proceedings of the third conference on chemical works safety, held at Scarborough from Sept. 29 to Oct. 1, may now be obtained from the Association of British Chemical Manufacturers, 166, Piccadilly, London, W.1 (5s. post free).

Appointments

GOODDY, W. W., M.D. Lond., M.R.C.P.: asst. physician, National Hospital, Queen Square, London.
GORDON, E. G., L.R.C.P.E.: asst. pathologist, Dudley and Stourbridge group of hospitals.
MCDOUGALL, J. H., M.B. Glasg., D.P.M.: deputy medical superintendent, Rampton Hospital.
VICKERY, K. O. A., M.D. Lond., D.P.H.: deputy M.O.H. and deputy school M.O., Bournemouth.

Appointed Factory Doctors:

DUNLOP, ROBERT, M.B. Belf.: St. Columb district, Cornwall.
RUSACK, L. S., M.B. Aberd.: Haddington district, East Lothian.
WOOLLEY, A. W., M.B.E., M.B. Brist.: Wells district, Somerset.

Colonial Service:

ANDRE, J. A. H., M.B.E., M.R.C.S.: deputy director of medical services, Mauritius.
BAILEY, C. E. S., M.B. Edin., D.T.M. & H., D.P.H.: asst. director of medical services, British Guiana.
CONRAN, H. W., M.D., D.P.H.: M.O., Fiji.
HALLMAN, G. O., M.D.: M.O., Fiji and South Pacific health service.
HOLLITSCHER, GERTRUD, M.D. Vienna: lady M.O., Federation of Malaya.
HUNTER, J. K., M.B. Glasg., D.T.M. & H., D.P.H.: asst. director of medical services, Uganda.
JAMES, OLIVER, M.B. Lond.: M.O. (temporary), Barbados.
KALINSKY, B., M.B.: M.O., British Guiana.
KIRWAN, E. J., M.B., M.CH. N.U.I.: special grade M.O., Nyasaland.
LUPPRIAN, K. G., M.B. Lond.: M.O., Federation of Malaya.
MADHOO, B. G., L.R.C.P.E.: M.O., Mauritius.
MITFORD-BARBERTON, G. DE B., B.M. Oxfd: M.O., Uganda.
OAKEY, J. S., M.B. Sydney: M.O., Tanganyika.
O'DEA, J. J., M.B. N.U.I.: M.O., Northern Rhodesia.
STOKER, G. E., M.C., M.R.C.S.: M.O. (temporary), General Hospital, Barbados.
SZELEY, A., M.D.: M.O. (temporary), Falkland Islands.
WRAY, J. R. R., M.R.C.S.: M.O., Kenya.

Births, Marriages, and Deaths

BIRTHS

ALEXANDER.—On Dec. 16, in Kingston, Jamaica, the wife of Dr. H. D. Alexander—a son.
ALTMANN.—On Dec. 17, in London, the wife of Dr. G. R. Altmann—a son.
BERMAN.—On Oct. 16, in New York, the wife of Dr. L. H. Berman—a daughter.
BRAINES.—On Dec. 13, in Jersey, the wife of Dr. Frederick Morley Braines—a daughter.
CURWEN.—On Dec. 15, in Bristol, the wife of Dr. Sydney Curwen—a son.
EASTCOTT.—On Dec. 18, in London, the wife of Mr. H. H. G. Eastcott, F.R.C.S.—a daughter.
FISHER.—On Dec. 14, in London, the wife of Dr. Oliver Fisher—a son.
LEE.—On Dec. 18, at Twickenham, the wife of Dr. Edward Lee—a daughter.
MAY.—On Dec. 17, at Chatham, Kent, to Dr. Madeleine May (née Mackenzie), the wife of Dr. G. A. May—a son.
PARKER.—On Dec. 17, in Manchester, the wife of Dr. L. Parker—a son.
QUINLAN.—On Dec. 15, at Stoke-on-Trent, the wife of Mr. A. G. Quinlan—a daughter.
URMSTON.—On Dec. 16, the wife of Dr. J. H. B. Urmston—a daughter.

DEATHS

FORD.—On Dec. 18, at Hertford, Alma Percy Ford, M.R.C.S., D.P.H.
HUGHES.—On Dec. 14, Muriel Hughes, M.B. Manc., D.P.M.
NEWBY.—On Dec. 14, at Croydon, Gervase Edward Newby, O.B.E., F.R.C.S., aged 81.
PARSONS.—On Dec. 17, in Birmingham, Sir Leonard Parsons, M.D. Lond., F.R.C.P., F.R.C.O.G., F.R.S., aged 71.
SMITH.—On Dec. 15, Sydney Watson Smith, M.D. Edin., F.R.C.P., F.R.C.P.E.
VAUGHAN.—On Dec. 13, Arthur Christopher Toulmin Vaughan, M.B. Lpool, aged 41.

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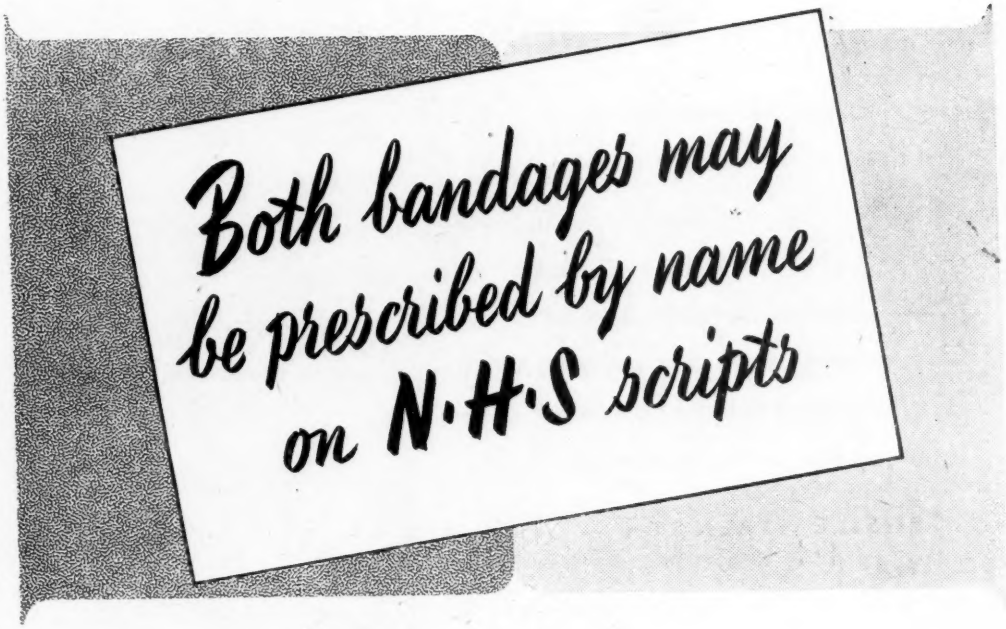

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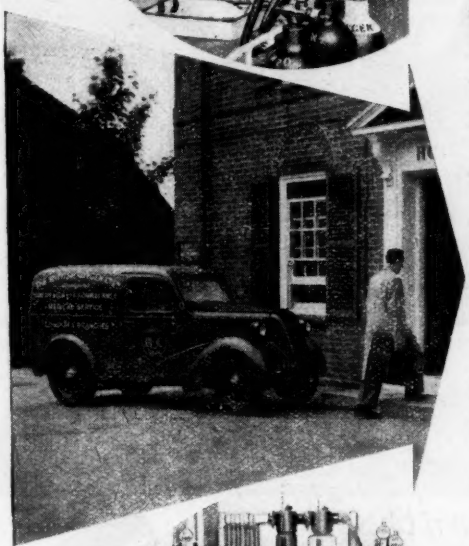

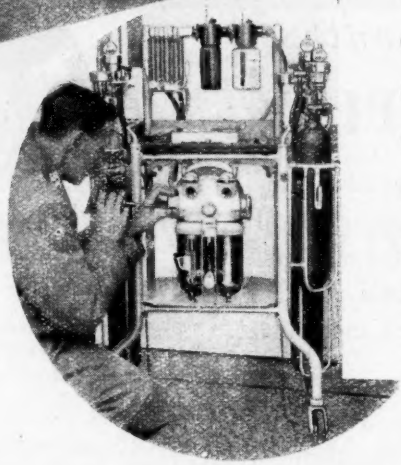

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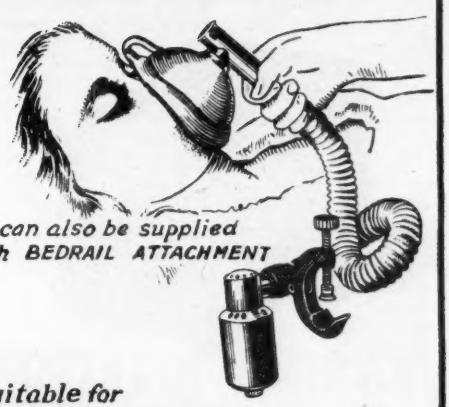

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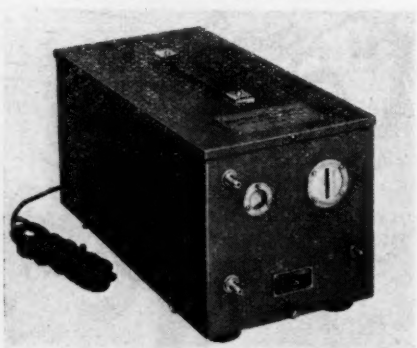

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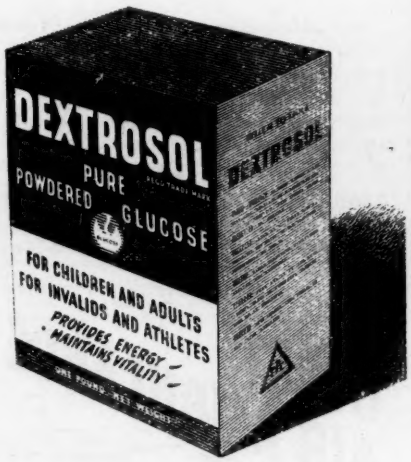

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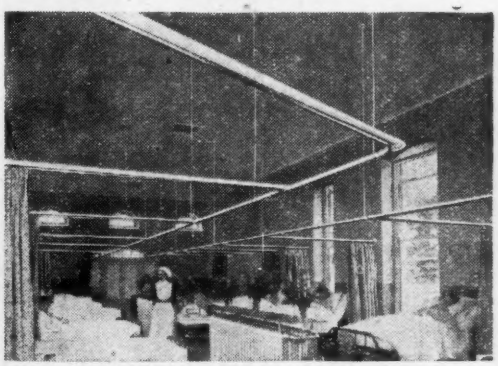

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Thursday, 1st February

DIPLOMA IN PHYSICAL MEDICINE

Friday, 16th February

Candidates who have fulfilled the necessary conditions and who desire to present themselves for Examination, must give notice in writing to the Secretary, Examination Hall, 8–11, Queen-square, London, W.C.1, at least 21 days before the date of the Examination, transmitting at the same time such certificates as may be required by the regulations of the Board, together with the full amount of the fee. Applications for Part II are due at the same time as for Part I.

F. M. STENT, Secretary.

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INSTITUTE OF CHILD HEALTH

WINTER TERM 1951

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8th January	The Influence of Environment on Disease in Childhood	Prof. Sir JAMES SPENCE, M.D., F.R.C.P.
15th January	The Economics of Child Health	Dr. J. D. KERSHAW
22nd January	The Future of the Child Health Services	Prof. W. S. CRAIG, M.D., F.R.C.P. (Ed.)
29th January	The Prevention of Tuberculosis in Childhood	Dr. B. THOMPSON
5th February	The Delinquent Child	Dr. D. CARROLL
12th February	Variations in Infective Diseases	Dr. H. S. BANKS
19th February	The Aims in the Care of the Mentally Deficient Child	Dr. B. KIRMAN
26th February	The Prevention of Accidents in Childhood	Dr. L. COLEBROOK
5th March	Investigation of Disease in the Home	Dr. F. J. W. MILLER
12th March	The Control of Inheritable Defects	Dr. J. A. FRASER ROBERTS

The fee for the course of 10 lectures is £3 3s.

Applications for tickets of admission, accompanied by a remittance, should be sent to the Secretary, Institute of Child Health, The Hospital for Sick Children, Great Ormond-street, London, W.C.1. Early application is advised, as the number of tickets is limited. G. H. NEWNS, Dean.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

COURT OF EXAMINERS

Notice is hereby given that the Council on 8TH MARCH, 1951, will elect 2 Members of the Court of Examiners. Of the Examiners retiring in rotation, Mr. H. C. Edwards and Mr. M. F. Nicholls do not seek re-election.

Fellows of the College desirous of becoming candidates for the office must make application, in writing, to the Secretary on or before 31st January, 1951.

KENNEDY CASSELS, Secretary.

Lincoln's Inn-fields, London, W.C.2.

THE UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE

The Faculty of Medicine, in conjunction with the St. Mary's Hospitals for Women and Children, proposes to conduct a POSTGRADUATE COURSE IN OBSTETRICS, especially intended for general practitioners. The course is to comprise 12 weekly meetings to be held on WEDNESDAYS from 10.0 A.M.–4.0 P.M. commencing on 24TH JANUARY and concluding on 11TH APRIL. The fee for the course is 7 guineas, though doctors taking part in the National Health Service may be able to claim the fee and travelling expenses from the Ministry of Health.

Applications should be made to the Dean of Postgraduate Medical Studies not later than 15th January, 1951.

THE INSTITUTE OF NEUROLOGY, Queen-square.

(Comprising The National Hospital, Queen-square, and The Hospital for Nervous Diseases, Maida Vale.)

At 5 P.M. on FRIDAY, 5TH JANUARY, 1951, a FILM will be shown at The National Hospital, Queen-square, of an Hemispherectomy performed by R. A. Krynauw, F.R.C.S. (Ed.), of Johannesburg, together with preoperative and postoperative shots.

Admission free, without ticket.

MACDONALD CRITCHLEY, Dean.

INSTITUTE OF PSYCHIATRY (University of London). There will be a vacancy on 1st March, 1951, for a SENIOR LECTURER. The duties of the post will be mainly concerned with the study of criminological aspects of psychiatry. Candidates should have had experience in research and in forensic psychiatry, and should possess an adequate knowledge of appropriate clinical, psychological, and social methods of investigation and treatment. The salary scale will be £1250–£100–£1750. The commencing salary will depend on qualifications and experience. The successful applicant will be eligible for F.S.S.U. superannuation and family allowance.

Application forms, to be returned within 14 days of the appearance of this announcement, from the Secretary, Institute of Psychiatry, Maudsley Hospital, Denmark-hill, S.E.5.

INSTITUTE OF UROLOGY (University of London) in association with ST. PETER'S and ST. PAUL'S HOSPITALS. Applications are invited for the post of DIRECTOR of the Institute (part-time). The Director will be expected to do research, and be responsible for the development of all research work. Duties will also include supervision of the administration, teaching, and follow-up work. Salary in accordance with seniority and time given to the work.

Applications (8 copies), with 8 copies of 3 recent testimonials, to the Secretary not later than 24th January, 1951.

SOUTH OAKS, a 229-Bed Psychiatric Hospital, environs New York City, has vacancy 2 FELLOWSHIPS IN PSYCHIATRY. $3000 per year, with full maintenance.

Apply M. S. TITLEY, M.D., Sunrise Highway, Amityville, New York.

Hospital Services : Senior Appointments

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the following Senior Hospital Medical Officer positions :—

Full-time ASSISTANT PATHOLOGIST with experience in morbid anatomy and histology at St. Margaret's Hospital, Epping.

Full-time ASSISTANT PATHOLOGIST at East Ham Memorial Hospital, Shrewsbury-road, E.7.

The terms and conditions of service for hospital medical staff will apply.

Separate applications (in duplicate), indicating post concerned and stating private address, date of birth, full details of qualifications and experience, present appointment, grade and salary, together with names and addresses of 3 referees, should reach C. E. NICOL, Secretary, 11A, Portland-place, London, W.1, by 6th January, 1951. Canvassing disqualifies.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the appointments of ANÆSTHETISTS with special experience in anæsthesia for thoracic surgery at the following hospitals :—

1. Colindale Hospital, The Hyde, Hendon, N.W.4 (234 Beds for the treatment of tuberculosis—the equivalent of 3 sessions per week, on Monday afternoons and Thursday mornings).

2. Pinewood Hospital, Wokingham, Berks (150 Beds, plus 30 temporarily unavailable, for the treatment of tuberculosis), 3 sessions per week, on Wednesdays (morning and afternoon) and alternate Thursday mornings.

The terms and conditions of service for hospital medical and dental staffs (consultants) will apply to the posts.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 13th January, 1951. Canvassing will disqualify, but candidates are invited to visit the hospitals by direct appointment with the Medical Superintendents.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the appointment of SURGEON to the above Hospital for 4 half-days per week. This is a general hospital of about 158 Beds. Applicants should possess a higher surgical qualification and have had wide experience in general surgery. The terms and conditions of service for hospital medical and dental staffs (Consultants) will apply to the post.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 20th January, 1951. Canvassing will disqualify, but candidates are invited to visit the Hospital by direct appointment with the Secretary of the Hospital.

ST. MARY'S HOSPITAL, London, W.2. Applications are invited for the appointment of Part-time CONSULTANT ANÆSTHETIST to the St. Mary's group, to undertake up to a maximum of 9 notional half-days per week. The duties of this appointment include attendance at the Constituent Hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments, together with the names and addresses of 3 referees, should reach the undersigned by 13th January, 1951. Canvassing will disqualify, but applicants are not precluded from visiting the Hospital.

12th December, 1950. ALAN POWDITCH, House Governor.

Provincial

For appointment of Assistant Pathologist (Senior Hospital Medical Officer) at St. Margaret's Hospital, Epping, see North East Metropolitan Regional Hospital Board advertisement in London section.

For appointment of Anæsthetist at Pinewood Hospital, Wokingham, Berks, see North West Metropolitan Regional Hospital Board advertisement with London appointments.

BATH CLINICAL AREA. South-Western Regional HOSPITAL BOARD invite applications from registered medical practitioners for the appointment of ANÆSTHETIST in the Bath Clinical Area which comprises Bath, North East Somerset, Mid and West Wilts. The appointment will be on a whole-time basis and the salary and terms and conditions of service will be those laid down by the Ministry for Senior Hospital Medical Officers (£1300–£1750 p.a.). Applicants should possess high medical qualifications, and wide experience in anæsthetics is essential. The successful applicant will be required to work under the general direction of the Consulting Anæsthetists mainly at the Royal United Hospital, Bath, and to visit other hospitals in the clinical area as may be required by the Regional Hospital Board from time to time.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be addressed to the Secretary of the South-Western Regional Hospital Board, 5, Cotham Lawn-road, Bristol, 6, so as to reach him not later than 13th January, 1951. Canvassing will disqualify, but this does not preclude applicants from visiting the hospitals concerned.

BRISTOL. UNITED BRISTOL HOSPITALS. South-WESTERN REGIONAL HOSPITAL BOARD. The United Bristol Hospitals and the South-Western Regional Hospital Board jointly invite applications from registered medical practitioners for appointment of a SENIOR CONSULTANT RADIOTHERAPIST to the Bristol, Bath, South Somerset, and North Gloucestershire areas. Appointee will act as Radiotherapist in charge of the centre at the teaching hospital, and will also be responsible for the coördination of the associated centres in Bath and North Gloucestershire. Duties of the post will include clinical instruction of students, and the candidate appointed will probably be given the status of Lecturer in Radiotherapy in the University Department of Surgery. Appointment will be on a whole-time basis, and the terms and conditions of service recently negotiated between the Ministry and the profession will apply. Candidates should preferably hold a higher qualification in medicine or surgery as well as a Diploma in Radiology.

Applications, stating full christian names, age, and particulars of education, qualifications, and experience, and accompanied by 2 recent testimonials and names of 2 referees, should be sent to undersigned, from whom further particulars can be obtained, not later than 31st January, 1951.

STEPHEN C. MERIVALE, Secretary to the Board of Governors.

Bristol Royal Infirmary, Bristol, 2.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CHILD-GUIDANCE TEAM. BUCKINGHAMSHIRE COUNTY COUNCIL. Applications are invited from suitably qualified medical practitioners with relevant experience for an appointment as Part-time CHILD PSYCHIATRIST to be in charge of a child-guidance team working in that part of the County of Buckinghamshire situated in this Region. The appointment is for 1 half-day per week. The successful candidate will be in the employment of the Board, but the child-guidance service will be administered by the Education Department of the Bucks County Council. The terms and conditions of service for hospital medical and dental staffs (Consultants) will apply to the post.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 6th January, 1951. Canvassing will disqualify.

ASHFORD HOSPITAL, Ashford, Middlesex. North West METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the appointment of ANÆSTHETIST, either whole-time or for maximum permitted number of sessions, at the above Hospital. This is a general hospital of approximately 600 Beds—mostly acute with the usual special departments. Applicants should possess a higher qualification and have wide experience in modern methods of anæsthesia. The terms and conditions of service for hospital medical and dental staffs (Consultants) will apply to the post.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 20th January, 1951. Canvassing will disqualify, but candidates are invited to visit the Hospital by direct appointment with the Medical Director.

BEDFORD GENERAL HOSPITAL, Bedford. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the appointment of E.N.T. SURGEON at the above Hospital for 3 or 4 half-days per week. This Hospital consists of 2 Hospitals which are being administered as a single unit, with a total complement of about 500 Beds and the usual Special Departments. The terms and conditions of service for hospital medical and dental staffs (Consultants) will apply to the post.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 13th January, 1951. Canvassing will disqualify, but candidates are invited to visit the Hospital by direct appointment with the Secretary of the Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the whole-time, non-resident post of CONSULTANT GROUP PATHOLOGIST to the Wigan and Leigh group of hospitals. The main Group Laboratory is at the Royal Albert Edward Infirmary, Wigan. Salary scale £1700–£2750; starting-point according to experience, &c. Candidates must be of high professional standing with good training and wide experience in hospital pathology. A higher qualification is desirable. The post is superannuable and the National Health Service terms and conditions of service will apply.

Application forms can be obtained from the Senior Administrative Medical Officer, No. 1 North Parade, Parsonage-gardens, Manchester, and should be returned, together with the names and addresses of 3 referees, to be received not later than 9th January, 1951. Canvassing will disqualify.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the following whole-time posts of ASSISTANT PSYCHIATRIST :—

(*a*) 2 posts at Prestwich Mental Hospital (2880 Beds), near Manchester. (Residential quarters available for single persons.)

(*b*) 1 post at Parkside Hospital (1430 Beds), near Macclesfield, Cheshire. (Married or single quarters available.)

Salary £1300–£1750 p.a.; starting-point according to age. Candidates should have had considerable experience in psychiatry and possess the D.P.M. The national terms and conditions of service will apply and the posts are superannuable. Applicants for more than 1 post should indicate their preference.

Forms of application can be obtained from the Senior Administrative Medical Officer, No. 1 North Parade, Parsonage-gardens, Manchester, and should be returned, together with the names and addresses of 3 referees, to be received not later than 8th January, 1951. Canvassing will disqualify.

PLYMOUTH CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited jointly by the Regional Hospital Board and the Local Authorities of Plymouth Corporation, Devon County Council and Cornwall County Council from registered medical practitioners for the appointment of CHEST PHYSICIAN in the Plymouth Clinical Area, and to South Devon and East Cornwall. The appointment will be on a whole-time basis, and the salary and terms and conditions of service will be those laid down by the Ministry for Senior Hospital Medical Officers (£1300–£1750 p.a.), subject to possible adjustment for local-authority work. Applicants should possess high medical qualifications, and previous experience in diseases of the chest is essential. The successful applicant will be required to reside in or near Plymouth, and his duties will be mainly concerned with the conduct of chest clinics in this area. Arrangements will be made for some inpatient work. He will also be required to collaborate with the Medical Officers of Health of Plymouth Corporation, Devon County Council and Cornwall County Council in connection with the tuberculosis services.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials and the names and addresses of 2 referees, should be addressed to the Secretary of the Regional Hospital Board, 5, Cotham Lawn-road, Bristol, 6, so as to reach him not later than 13th January, 1951. Canvassing will disqualify.

WELSH REGIONAL HOSPITAL BOARD invite applications from registered medical practitioners for the whole-time appointment of an ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer grade), to serve the Pontypridd and Rhondda Area. He will be based at Pontypridd Chest Clinic and will work under the direction of the Consultant Chest Physician. Candidates should have had a wide experience in chest diseases and tuberculosis in particular. Salary in accordance with the terms and conditions of service of hospital medical staff subject to possible adjustment in respect of local-authority work.

Applications, stating date of birth, giving a summary of qualifications, experience, and publications, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement. Canvassing will disqualify, but this does not preclude candidates from visiting hospitals in the area.

WELSH REGIONAL HOSPITAL BOARD invite applications from registered medical practitioners for the following whole-time appointments in the grade of Senior Hospital Medical Officer :—

ASSISTANT CHEST PHYSICIAN, Pembrokeshire Area. (Headquarters Haverfordwest.)

ASSISTANT CHEST PHYSICIAN, Carmarthenshire Area. (Headquarters Llanelly.)

In each case the successful candidate will work under the direction of the Chest Physician in charge of the area. Candidates should have had a wide experience in chest diseases and tuberculosis in particular. Salary in accordance with the terms and conditions of service of hospital medical staff subject to possible adjustment in respect of local authority work.

Applications, stating date of birth, giving a summary of qualifications, experience, and publications, with names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement. Canvassing will disqualify, but this does not preclude candidates from visiting hospitals in the area.

WINDSOR, BERKS. KING EDWARD VII HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD invite applications for the appointment of NEUROLOGIST at the above Hospital (200 Beds) for 2 half-days a week. Candidates should possess a higher qualification and have had considerable experience in this specialty. The terms and conditions of service for hospital medical and dental staffs (Consultants) will apply to the post.

Applications, stating date of birth, qualifications, and experience, with the names of 3 referees, should reach the Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, not later than 13th January, 1951. Canvassing will disqualify, but candidates are invited to visit the Hospital by direct appointment with the Secretary of the Hospital.

SOUTH SOMERSET CLINICAL AREA. South-Western REGIONAL HOSPITAL BOARD invite applications from registered medical practitioners for the appointment of RADIOLOGIST in the South Somerset Clinical Area. The appointment may be held either on a whole-time or maximal (9 sessions) part-time basis, and the salary and terms and conditions of service will be those negotiated for consultants between the Ministry and the profession. Applicants should have had wide experience in radiology and possession of the D.M.R. is essential. The successful applicant will be required to coördinate and develop the radiological service in the South Somerset Area, and to visit all hospitals in this Clinical Area as may be required by the Regional Board from time to time. The main centre will be at the Taunton and Somerset Hospitals, Taunton.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials and the names and addresses of 2 referees, should be addressed to the Secretary of the Regional Hospital Board, 5, Cotham Lawn-road, Bristol, 6, so as to reach him not later than 13th January, 1951. Canvassing will disqualify but this does not preclude applicants from visiting the hospitals concerned.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. BRIDGE OF EARN HOSPITAL, PERTHSHIRE. (800 Beds.) Applications are invited for the whole-time post of ANÆSTHETIST at Bridge of Earn Hospital (400 general surgical and orthopædic beds). The anæsthetic services are under the supervision of the Consultant Anæsthetist for the Perth Area. Salary £1300–£50–£1750. Terms and conditions of service in accordance with national agreem nt.

Further particulars and form of application may be had from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged within 14 days from this date.

NEW ZEALAND. COOK HOSPITAL BOARD, Gisborne, NEW ZEALAND. Applications, closing 16th February, 1951, are invited for the position of PATHOLOGIST. Commencing salary from £1000 to £1500 N.Z. p.a., according to qualifications and experience.

Full particulars obtainable on application to the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Applications should be forwarded direct to the Managing Secretary, Cook Hospital Board, Gisborne, New Zealand.

VELLORE, S. INDIA. CHRISTIAN MEDICAL COLLEGE HOSPITAL. Required, ANÆSTHETIST. Applicants must have experience of modern methods of anæsthesia and should hold the D.A. The Hospital is recognised for the English diploma and includes special thoracic and neurosurgical units. Teaching experience is an advantage. This is a Union Christian College and sympathy with the work of the Institution is necessary. The post carries an allowance of Rs. 300/- per mensem (approximately £275 a year) for a single person and the appointment is usually made for 5 years in the first place.

Applications, stating qualifications and experience, should be sent to Dr. C. C. CHESTERMAN, 149, Harley-street, London, W.1.

UNIVERSITY OF CAPE TOWN, South Africa. Applications are invited for the post of SENIOR ASSISTANT in the Department of Anatomy of the Medical School. The salary scale is £800–£40–£1000 p.a., plus a temporary cost-of-living allowance, which at present is £208 p.a. for a married man and £83 p.a. for a single person.

Applications (with copies of testimonials) should state age, experience, qualifications, and research work completed or in progress, and give the names of 2 referees whom the University may consult. 2 copies of the application and testimonials should reach the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1 (from whom a memorandum giving the general conditions of appointment should be obtained) not later than 31st January, 1951. An additional copy should be sent direct by air mail to the Registrar, University of Cape Town, Private Bag, Rondebosch, South Africa, by the same date.

Hospital Services : Junior Appointments

BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. HOUSE SURGEON (Neurosurgical Unit). The post is resident and tenable for 6 months. Salary £400 or £450 a year, according to experience, less £100 p.a. for residential emoluments.

Applications, together with copies of 2 recent testimonials, to be sent to Secretary, Woolwich Group Hospital Management Committee, Memorial Hospital, Woolwich, S.E.18.

COLINDALE HOSPITAL, Colindale-avenue, The Hyde, N.W.9. RESIDENT JUNIOR HOUSE SURGEON (second or third post) required at the above Hospital to assist in thoracic, orthopædic, and genito-urinary surgery, post vacant middle January, 1951. Salary £400–£450 p.a., according to experience. Deduction of £100 p.a. for board, lodging, &c. 6 months' appointment, terminable by 1 month's notice.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials to the Physician-Superintendent, as soon as possible.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. Applications are invited from registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st March, 1951. Appointment for 6 months. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary by 9th January.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. Applications are invited from registered Women medical practitioners for the post of HOUSE SURGEON for Gynæcological and Special Departments. Duties to commence 1st March, 1951. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary by 9th January.

GERMAN HOSPITAL, Dalston, E.8. Hospital Management COMMITTEE, HACKNEY GROUP (NO. 6). Applications invited for the following 6 months' resident appointment, now vacant: HOUSE SURGEON (first, second, or third post). Salary £350–£450 p.a. Conditions of service as approved for hospital medical and dental staffs, with deduction of £100 p.a. for residential amenities.

Applications, with copies of 3 testimonials, to be sent to the Group Secretary, Hackney Hospital, Homerton High-street, London, E.9, immediately.

HOSPITALS FOR DISEASES OF THE CHEST. Applications are invited from suitably qualified medical practitioners for the post of RESIDENT SURGICAL FIRST ASSISTANT AND REGISTRAR at the Hospital's Country Branch, Arlesey, Beds (near Letchworth). The post is graded Senior Registrar and the appointment is for 1 year and renewable. Higher surgical qualifications and experience in thoracic surgery essential.

Applications (6 copies), with copies of 3 testimonials, should be sent to the Secretary, London Chest Hospital, E.2 (from whom further particulars may be obtained), to arrive by 20th January, 1951.

HOSPITALS FOR DISEASES OF THE CHEST. Applications are invited for the following whole-time appointments from registered medical practitioners, Male and Female.

SURGICAL REGISTRAR (non-resident) at Brompton Hospital, S.W.3, for which there are 2 vacancies. Appointments are for 6 months commencing 1st February, 1951, with eligibility for reappointment. Applicants must have held a resident hospital appointment. Salary according to national scale.

SENIOR HOUSE PHYSICIAN (non-resident), at Brompton Hospital, S.W.3. Appointment is for 6 months commencing 1st February, 1951. Experience in artificial pneumothorax essential and in E.N.T. work desirable. Salary at Junior Registrar rate.

HOUSE PHYSICIAN (resident), at Brompton Hospital, S.W.3, for which there are 3 vacancies. Appointments are for 6 months commencing 1st February, 1951. Duties include work in the Outpatient Department as well as in the wards. Salary £400 or £450 a year, according to experience.

HOUSE PHYSICIAN (resident) at Brompton Hospital Sanatorium, Frimley. Appointment is for 6 months commencing 1st February, 1951. Salary £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, nationality, and previous appointments held, and accompanied by copies of 1 or more recent testimonials, should reach the undersigned not later than 6th January, 1951.

Brompton Hospital, S.W.3. F. G. ROUVRAY, Secretary.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications invited from suitably qualified medical practitioners for the post of ANÆSTHETIC REGISTRAR (part-time). The grading will be that of Registrar or Senior Registrar, according to qualifications and experience. The appointment is for 1 year and renewable, and attendance is required on 7 notional half-days a week, including 3 at the Country Branch.

Applications, stating age, qualifications with dates, and previous appointments held, and accompanied by copies of 3 testimonials, should reach the undersigned not later than 20th January, 1951.

London Chest Hospital, E.2. THOMAS BROWN, Secretary.

MILE END HOSPITAL, Bancroft-road, London, E.1. (455 Beds.) Required, SENIOR HOUSE OFFICER (Casualty Department). The successful candidate may elect to be non-resident. Salary, &c., in accordance with national scale.

Application forms obtainable from the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

KING EDWARD MEMORIAL HOSPITAL, Ealing, W.13. JUNIOR REGISTRAR to the Senior Surgeon, Gynæcologist, and Deputy Resident Surgical Officer. Salary £670 p.a., terms and conditions as approved for hospital medical staff.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials, to the Secretary, South West Middlesex Hospital Management Committee, 1, Churchfield-road, Ealing, W.13, by 12th January, 1951.

MEMORIAL HOSPITAL, Shooters-hill, S.E.18. House SURGEON (recognised for F.R.C.S.), vacant approximately 16th February. The post is resident and tenable for 6 months. Salary £400 or £450 a year, according to experience, less £100 p.a. for residential emoluments.

Applications, together with copies of 2 recent testimonials, to be sent to Secretary, Woolwich Group Hospital Management Committee, Memorial Hospital, Woolwich, S.E.18.

NATIONAL HOSPITAL FOR NERVOUS DISEASES, Queen-square, London, W.C.1. Applications invited from registered medical practitioners for appointment of ANÆSTHETIC REGISTRAR (non-resident). This post carries the grade of Senior Registrar. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs. Appointment will be for a period of 1 year in the first instance.

Applications, with copies of testimonials, to be sent to the undersigned not later than 1st January, 1951.

H. EWART MITCHELL, Secretary.

NEW END HOSPITAL, Hampstead, N.W.3. Archway GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (obstetrical and gynæcological), post vacant 11th January, 1951. Salary in accordance with the national scale.

Applications, stating age, qualifications, and previous experience, accompanied by copies of testimonials, to Surgeon-Specialist Superintendent, New End Hospital, New End, N.W.3, not later than 8th January, 1951.

PRINCE OF WALES'S GENERAL HOSPITAL. (231 Beds.) Required, RESIDENT CASUALTY OFFICER (third post) for a period of 6 months, commencing 5th March, 1951. Salary in accordance with the terms of service issued by the Ministry of Health.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, Tottenham, N.15, to be returned to the Secretary by 12th February, 1951.

PRINCE OF WALES'S GENERAL HOSPITAL. (231 Beds.) Required, RESIDENT SENIOR HOUSE PHYSICIAN (third post), for a period of 6 months commencing 9th March, 1951. Salary in accordance with the terms of service issued by the Ministry of Health.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, Tottenham, N.15, to be returned to the Secretary by 5th February, 1951.

PRINCE OF WALES'S GENERAL HOSPITAL. (231 Beds.) Required, RESIDENT JUNIOR HOUSE PHYSICIAN (first or second post), for a period of 6 months commencing 7th March, 1951. Salary in accordance with the terms of service issued by the Ministry of Health.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, Tottenham, N.15, to be returned to the Secretary by 5th February, 1951.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE (GROUP 27), Hackney-road, E.2, Shadwell, E.1, and Banstead Wood, Surrey. Applications invited from suitably qualified practitioners (Male and Female) including R practitioners within 3 months of qualification for 3 appointments as HOUSE OFFICERS, vacant on 1st March, 1951. These appointments, which will be made in accordance with the terms of service issued by the Ministry of Health, will be made for 2 periods of 6 months each. First period as House Physician (including 2 weeks' leave), followed by second period as House Surgeon (including 2 weeks' leave), and Casualty Officer.

Application forms may be obtained from the undersigned and should be returned, with copies of not more than 3 testimonials, on or before 15th January, 1951.

Hackney-road, E.2. CHARLES H. BESSELL, Secretary.

ST. ANN'S GENERAL HOSPITAL, St. Ann's-road, London, N.15. HOUSE PHYSICIAN (second or third post), required on 1st February, 1951, for the Infectious Diseases Unit. Salary £400 or £450 p.a., less £100 for residential emoluments, according to previous experience. The Hospital also has pædiatric, chest, and chronic sick beds.

Application forms obtainable from the Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, and returnable, with 3 recent testimonials, not later than 15th January, 1951.

ST. JOHN'S HOSPITAL, Morden-hill, Lewisham, London, S.E.13. LEWISHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT CASUALTY OFFICER (first, second, or third post), vacant 15th January, 1951, and tenable for 6 months. Salary at rate of £350–£450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials or names of referees, should be sent to the Secretary at the Hospital as soon as possible.

ST. GILES' HOSPITAL, Camberwell, S.E.5. Required, HOUSE OFFICER (anæsthetic duties). Salary £350, £400, or £450 a year, according to experience. Appointment tenable for 6 months in first instance. Resident post with deduction at rate of £100 a year for board, lodging, and other services provided.

Applications, stating age, details of qualifications, and experience, and enclosing copy testimonials, to the Secretary, Camberwell Hospitals Management Committee, Dulwich Hospital, S.E.22, as soon as possible.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. NORTHERN GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON AND CASUALTY OFFICER, post vacant 10th February, 1951, for a period of 6 months. Salary at the rate of £400–£450 p.a., according to experience, with a deduction of £100 p.a. in respect of residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent to the undersigned not later than 13th January, 1951. GILBERT G. PANTER, Secretary.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications invited for appointment as RESIDENT JUNIOR SURGICAL REGISTRAR for a vacancy occurring last week in January. Applicants should have held house appointments and have had surgical experience. Residence in the Hospital is essential. Salary £670 p.a., inclusive of full residential emoluments.

Applications, stating age, qualifications, past and present appointments, with copies of 3 recent testimonials, must reach the Honorary Secretary at the Hospital by first post, 4th January, 1951.

ROYAL NATIONAL THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, London, W.C.1, and Golden-square, W.1. There will be a vacancy for a post of RESIDENT HOUSE SURGEON (second or subsequent post) on 1st March, 1951. Appointment for 6 months, with salary as laid down for House Officer grades in the terms and conditions of service under the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent not later than 31st January, 1951. JOHN H. YOUNG, House Governor and Secretary.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications invited from registered medical practitioners for appointment of SIXTH HOUSE SURGEON to the Orthopædic Department. The appointment will commence as soon as possible and continue until 30th June, 1951. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health for House Officers.

Application forms may be obtained from the House Governor at the above address, and should be returned as soon as possible.

ST. GEORGE'S HOSPITAL, S.W.1. Required, House PHYSICIAN for duty at the Grove Hospital, Tooting, London, S.W., in connection with the opening there of some 50 tuberculosis beds by St. George's. Preference may be given to applicants who have already held a House Officer post, and the successful candidate will be required to take up duties on or about 1st February, 1951. The terms and conditions of the appointment will be in accordance with the National Health Service Acts.

Applications, together with the names of 2 referees, must be received by the undersigned by 12th January, 1951.

P. H. CONSTABLE, House Governor.

Provincial

ASHTON-UNDER-LYNE. LAKE HOSPITAL. (600 Beds.) Required, HOUSE PHYSICIAN for duty at above Hospital and at other hospitals in the group if required. Appointment limited to 6 months. Salary £350–£450 p.a., according to experience, less £100 p.a. for board and lodging, &c. R practitioners within 3 months of qualification, also those holding first posts, may apply.

Applications should be addressed to—

R. W. MCVITY, Secretary, Ashton, Hyde, and Glossop Hospital Management Committee.

Astley-road, Stalybridge, Cheshire.

ASHTON-UNDER-LYNE. LAKE HOSPITAL. (600 Beds.) Required, OBSTETRIC HOUSE SURGEON at above Hospital, which has a Maternity Unit of 65 Beds and a Gynæcological Ward of 30 Beds. The Hospital is recognised for the D.Obst. R.C.O.G. It is within 6 miles of the centre of Manchester and University facilities. Considerable practical experience available for those with a sound academic training. Preference given to applicants with experience as Hospital House Officers. Appointment limited to 6 months. Salary £350–£450 p.a., according to experience, less £100 p.a. for board and lodging, &c. R practitioners within 3 months of qualification, also those holding first posts, may apply.

Applications, stating age, nationality, qualifications, and experience, with copies of 3 recent testimonials, should be forwarded to—

R. W. MCVITY, Secretary, Ashton, Hyde, and Glossop Hospital Management Committee.

Astley-road, Stalybridge, Cheshire.

ASHTON-UNDER-LYNE. LAKE HOSPITAL. (600 Beds.) Required, HOUSE SURGEON. Duties entirely surgical. Resident at above Hospital, but includes general surgical duties under same Surgeon at Ashton Infirmary. Appointment limited to 6 months. Salary £350–£450 p.a., according to experience, less £100 p.a. for board and lodging, &c. R practitioners within 3 months of qualification, also those holding first posts, may apply.

Applications should be addressed to—

R. W. MCVITY, Secretary, Ashton, Hyde, and Glossop Hospital Management Committee.

Astley-road, Stalybridge, Cheshire.

ABERDEEN ROYAL INFIRMARY AND WOODEND HOSPITAL. HOUSE OFFICER in Anæsthetics required immediately for duty in the above Hospitals for a period of approximately 6 months with the possibility of reappointment for a further similar period. Applicants should have held previous House Physician or House Surgeon posts. The post may be resident or non-resident as desired. Salary within the range £350–£450 p.a., according to previous experience.

Applications, giving full details, should be lodged without delay with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen.

AYLESBURY. STOKE MANDEVILLE HOSPITAL. HOUSE PHYSICIAN (second or third post), vacant 12th February. Main duties of post at above Hospital which ultimately will be the centre of Medical Unit. Close liaison with Royal Bucks Hospital, where Outpatient Clinics are held.

Further particulars can be obtained from the Secretary, Aylesbury and District Hospital Management Committee, to whom applications should be addressed, with 2 testimonials, by 5th January, 1951.

9, Bicester-road, Aylesbury.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for medical and surgical wards. 6 months' appointment, vacant early January. National Health Service salary and conditions of service.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BARNET GENERAL HOSPITAL, Barnet, Herts. Junior REGISTRAR (Casualty Officer) required. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs (England and Wales).

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, should be sent immediately to the Medical Director.

BARNET GENERAL HOSPITAL, Barnet, Herts. House PHYSICIAN (first or subsequent appointment). 6 months' appointment from 12th January, 1951. Salary in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, stating age, experience, qualifications, together with copies of 3 recent testimonials, should be sent immediately to the Medical Director of the Hospital.

BATH. ST. MARTIN'S HOSPITAL. Required, House SURGEON. Salary and conditions of service in accordance with those issued by the Ministry of Health, plus an additional £50 p.a. in excess of the standard scale.

Applications, stating age, qualifications, and experience, to be received by the undersigned, with copies of 3 testimonials, as soon as possible. J. LAWRENCE MEARS, Secretary, Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ROYAL NATIONAL HOSPITAL FOR RHEUMATIC DISEASES. Required, HOUSE PHYSICIAN. Salary in accordance with terms and conditions of service laid down by Ministry of Health. Hospital is recognised for Part II of D.Phys.Med.

Applications, stating age, qualifications, and experience, with 3 recent testimonials, to be received by undersigned as soon as possible. J. LAWRENCE MEARS, Secretary, Bath Hospital Management Committee.

Manor Hospital, Bath.

BEBINGTON, WIRRAL. CLATTERBRIDGE GENERAL HOSPITAL. (728 Beds.) CENTRAL WIRRAL GROUP. SENIOR HOUSE OFFICER (pædiatrics), resident. National Health Service salary and conditions. Further details from Medical Superintendent.

Applications, stating qualifications, experience, and names of 2 referees, to Secretary immediately.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. Applications invited for appointment of ORTHOPÆDIC, TRAUMATIC, AND CASUALTY REGISTRAR (Junior Registrar grade) on either a resident or non-resident basis. Hospital comprises 189 Beds with large Outpatient Departments. Duties comprise service in the Orthopædic, Traumatic, and Casualty Departments. Salary £670 p.a., less £100 p.a. for emoluments, if resident.

Applications, stating age, qualifications, experience, and intimation as to whether a residential or non-residential post is required, and accompanied by copies of 2 recent testimonials, should be forwarded to the Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness.

BECKENHAM MATERNITY HOSPITAL. Bromley GROUP HOSPITAL MANAGEMENT COMMITTEE. OBSTETRIC HOUSE OFFICER required. Appointment is tenable for 6 months. Salary £400–£450 p.a., according to experience, less £100 a year in respect of board and lodging and other services provided. The Hospital is approved for the D.Obst. R.C.O.G. Candidates with some previous obstetric experience would be preferred.

Applications, with the names and addresses of 3 referees, should be sent to the Administrative Officer, Beckenham Hospital, Croydon-road, Beckenham, Kent.

BRISTOL CLINICAL AREA. United Bristol Hospitals. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above boards from registered medical practitioners for the joint appointment of SENIOR REGISTRAR in Plastic Surgery. Candidates should possess high surgical qualifications, and previous experience in plastic surgery is essential. The appointment will be held for 1 year in the first instance when the contract will be terminated. The appointment, however, which is subject to the terms and conditions of service of hospital medical and dental staffs, may be renewed for a further 1 or 2 years. The successful applicant will be required to work in the Department of Jaw and Plastic Surgery at Frenchay Hospital, Bristol, and to visit other hospitals in the clinical area as may be required by the Regional Hospital Board from time to time.

Applications (8 copies), stating date of birth, qualifications, and experience, together with 8 copies of 2 testimonials, and the names and addresses of 2 referees, should be addressed to the Secretary of the Regional Hospital Board, 5, Cotham Lawn-road, Bristol, 6, so as to reach him not later than 13th January, 1951. Canvassing will disqualify, but this does not preclude applicants from visiting the hospitals concerned.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. COSSHAM MEMORIAL HOSPITAL. (101 Beds—General and Casualty.)

HOUSE PHYSICIAN (first post) required 1st March, 1951.

HOUSE SURGEON AND CASUALTY OFFICER (first post) required 1st March, 1951.

National salary scale and conditions.

Applications, with full particulars, should be sent to the Group Secretary, Frenchay Hospital, Bristol.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. Applications invited from registered medical practitioners for the post of CLINICAL ASSISTANT in the Outpatient Department, attending on Tuesday and Friday mornings, to take up duty on 1st January, 1951. Salary in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, stating full particulars of experience and qualifications, with the names of 2 referees, should be forwarded to J. PRESTON, Secretary, Hospital Management Committee.

Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, SENIOR HOUSE OFFICER, to take up duty 1st February, 1951. Applicants must have held house appointments and have had wide experience in the specialty, possessing the Diploma in Ophthalmology. Appointment in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and for an initial period of 6 months.

Applications, stating age, nationality, particulars of experience and qualifications, with the names of 2 referees, should be forwarded to the undersigned.

J. PRESTON, Esq., Secretary,
Hospital Management Committee.

Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. THE BIRMINGHAM (DUDLEY ROAD) GROUP OF HOSPITALS. Required, HOUSE SURGEON, to take up duty 1st February, 1951. Salary in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Appointment will be for not less than 12 months, to enable the successful candidate to prepare for the Diploma in Ophthalmology.

Applications, stating age, nationality, particulars of qualifications and experience, should be forwarded to the undersigned, together with the names of 2 referees.

J. PRESTON, Secretary,
Hospital Management Committee.

Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. RUBERY HILL HOSPITAL. BIRMINGHAM NO. 6 GROUP (MENTAL B) HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR HOUSE OFFICER (Male or Female), resident or non-resident, for above Hospital. Duties to commence as soon as possible. A comprehensive programme of treatment is in operation, including both physical and psychological approaches, and there is also an active psychiatric outpatient clinic at the Selly Oak Hospital, Birmingham. Previous postgraduate experience is not essential, but applicants should normally have held the post of House Officer in a general hospital. The appointment which will be for 1 year will be in accordance with the Ministry of Health terms and conditions of service. Salary £670 p.a., with deduction, if resident, of £100 for board and lodging, and subject to the National Health Service (Superannuation) Regulations, 1950.

Applications, stating full name, age, nationality, qualifications, and experience, and providing the names of 3 referees, to be sent within 14 days of the publication of this advertisement to the Secretary, Offices of the Group Hospital Management Committee, Rubery Hill Hospital, Birmingham.

BIRMINGHAM, 31. HOLLYMOOR HOSPITAL, North-FIELD. BIRMINGHAM NO. 6 GROUP (MENTAL B) HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR HOUSE OFFICER (Male or Female), resident or non-resident, at above Hospital. Duties to commence as soon as possible. The Hospital, which has undergone extensive renovation, has accommodation for over 600 patients. A comprehensive programme of treatment is in operation, including both physical and psychological approaches, and there is also an active psychiatric outpatient clinic at the Selly Oak Hospital, Birmingham. Previous postgraduate psychiatric experience is not essential, but applicants should normally have held the post of House Officer in a general hospital. The appointment which will be for 1 year, will be in accordance with the Ministry of Health terms and conditions of service. Salary £670 p.a., with deduction, if resident, of £100 p.a. for board and lodging, and subject to the National Health Service (Superannuation) Regulations, 1950.

Applications, stating full name, age, nationality, qualifications, and experience, and providing the names of 3 referees, to be sent within 14 days of the publication of this advertisement to the Secretary, Offices of the Group Hospital Management Committee, Rubery Hill Hospital, Birmingham.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. Applications invited for the post of NON-RESIDENT ANÆSTHETIST REGISTRAR (Registrar grade). Duties to commence as soon as possible. Salary will be in accordance with the terms and conditions of service of hospital medical and dental staffs. The appointment is a recognised post for the purpose of taking the Diploma in Anæsthetics. Preference will be given to candidates who have passed Part I, D.A.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him not later than 20th January.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. GENERAL HOSPITAL. Applications are invited for the post of CASUALTY SURGICAL REGISTRAR (non-resident), Senior Registrar grade, for duty in the Casualty Department at the above Hospital. Candidates must be registered medical practitioners, have held a resident appointment in a teaching hospital, and should possess the F.R.C.S. Salary in accordance with the terms and conditions of service of hospital medical and dental staffs.

Forms of application may be obtained from, and should be returned not later than 20th January to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. GROUP 25 BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following positions :—

Selly Oak Hospital, Birmingham, 29 (1098 Beds)

RESIDENT CASUALTY OFFICER. Salary in accordance with the national scale for Junior Registrars, the appointment being tenable in the first instance for 6 months.

HOUSE PHYSICIANS.

HOUSE SURGEONS.

HOUSE SURGEONS (Gynæcological and obstetrical).

Above appointments vacant shortly. Salary according to the national scale for House Officers, the appointments being tenable in the first instance for 6 months.

Applications, giving age, experience, and qualifications, with copies of 3 recent testimonials, to the Medical Superintendent.

Birmingham Accident Hospital, Birmingham, 15 (209 Beds)

HOUSE SURGEON (Male or Female). The appointment will be for a period of 6 months, of which the first 2 will be with the Burns Unit (Medical Research Council) and the remainder in general traumatic service. The Hospital treats 50,000 new patients each year. The post offers practical experience in the treatment of all types of injury and includes a course of instruction on accident surgery given by the Consultant staff. Salary in accordance with the national scale for House Officers.

Detailed applications, accompanied by copies of recent testimonials, to be sent to the Administrator.

BIRMINGHAM, 23. HIGHCROFT HALL (MENTAL) HOSPITAL. (1400 Beds.) HIGHCROFT HALL HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of RESIDENT JUNIOR MEDICAL OFFICER (Male or Female). Accommodation available. Salary £700–£50–£1000. The Committee are prepared to consider applications for a non-resident Officer subject to sleeping in Hospital during nights on duty rota and emergencies, accommodation provided.

Applications to Medical Superintendent.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. Required, ORTHOPÆDIC HOUSE OFFICER, first, second, or third post, at above Hospital. Salary first post £400, second post £450, and third post £500, less a deduction of £100 for board and lodging.

Applications, with copies of 3 recent testimonials, should be sent as soon as possible to the Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester.

BRADFORD. ST. LUKE'S HOSPITAL. House Surgeon (orthopædic and accident). Salary £350–£450 p.a., according to experience, less £100 p.a. emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Royal Infirmary, Bradford.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON, post vacant 26th January, 1951. Salary in accordance with National Health Service scale £350–£450 p.a., with a deduction of £100 p.a. for full residential emoluments.

Applications, stating age, experience, nationality, and qualifications, with copies of 3 testimonials, to the Assistant Secretary of the above Hospital.

BURY GENERAL HOSPITAL. (164 Beds.) Required, HOUSE SURGEON. Post recognised for the F.R.C.S. Hospital is mainly surgical and experience can be gained in orthopædic and E.N.T. work. Salary and conditions of service in accordance with national scale.

Applications, giving full details of qualifications and experience, should be made immediately to—

H. WILKINSON, Secretary,
Bury and Rossendale Hospital Management Committee.
Bury General Hospital, Bury, Lancs.

BURY GENERAL HOSPITAL, Bury, Lancs. (An Acute General Hospital of 178 Beds, mainly surgical with beds for orthopædic and other specialties.) Required, JUNIOR ANÆSTHETIC REGISTRAR (resident or non-resident). Post vacant 31st December, and is recognised for the D.A. Tenure of appointment 1 year. Salary, &c., in accordance with the terms and conditions of service for hospital medical and dental staffs (England and Wales), that is, £670 p.a., non-resident (with a deduction of £100 where the post is resident).

Applications, stating age, nationality, qualifications, and experience, with copies of 2 testimonials, should be forwarded immediately to undersigned, from whom further particulars can be obtained. H. WILKINSON, Secretary,

Bury and Rossendale Hospital Management Committee.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) WEST SUFFOLK HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (first or second post) for Pædiatric and General Medical Department, post vacant early January, 1951. Appointment initially for 6 months. Salary £350 or £400 p.a., less £100 emoluments, in accordance with National Health Service conditions of service, &c.

Applications, stating age, nationality, qualifications, and experience, with no more than 3 recent testimonials, to the House Governor.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) WEST SUFFOLK HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (first or second post) for General Surgical Department, post vacant early January, 1951. Appointment initially for 6 months. Salary £350 or £400 p.a., less £100 emoluments, in accordance with National Health Service conditions of service, &c.

Applications, stating age, nationality, qualifications, and experience, with no more than 3 recent testimonials, to the House Governor.

BURY ST. EDMUND'S. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) WEST SUFFOLK HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (first or second post) for Ophthalmic and E.N.T. Department, post vacant early January, 1951. Appointment initially for 6 months. Salary £350 or £400 p.a., less £100 emoluments, in accordance with National Health Service conditions of service.

Applications, stating age, nationality, qualifications, and experience, with no more than 3 recent testimonials, to the House Governor.

BOWDON, CHESHIRE. MANCHESTER THROAT AND CHEST HOSPITAL. (53 Beds.) Required, JUNIOR E.N.T. REGISTRAR (non-resident) to commence as soon as possible. 12 months' appointment. This appointment is in a busy hospital staffed by Manchester Consultants and offers excellent opportunities of practical experience to suitably qualified candidates. Salary £670 p.a. Conditions as laid down in accordance with the terms of service issued by the Ministry of Health.

Applications, stating age, qualifications, &c., should be forwarded to the Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. Applications are invited from registered medical practitioners (Male and Female) for the appointment of HOUSE PHYSICIAN at Addenbrooke's Hospital, vacant on 1st February, 1951. Salary (resident) £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent on or before 10th January, 1951, to—

J. A. BEARDSALL, Secretary.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (240 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, ORTHOPÆDIC HOUSE SURGEON. Appointment vacant early in January, 1951, and limited to 6 months. Previous experience in orthopædic surgery an advantage. Post is recognised for the F.R.C.S. Diploma. Salary £400 or £450 p.a., according to number of posts held, with a deduction of £100 p.a. for residential emoluments.

Applications, giving age, full particulars of qualifications with dates, and experience, with copies of 3 recent testimonials, should be forwarded as soon as possible to M. D. KAY, Chief Administrative Officer at the Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (240 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, SENIOR HOUSE SURGEON (Male), post vacant early in January, 1951. Appointment for 6 months. Appointment is recognised for the F.R.C.S. Diploma, and salary will be £400 or £450 p.a., according to the number of posts held, with a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications with dates, and details of previous experience, with copies of 3 recent testimonials, should be forwarded as soon as possible to M. D. KAY, Chief Administrative Officer at the Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (240 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, OBSTETRICAL AND GYNÆCOLOGICAL HOUSE SURGEON, post becomes vacant in January, 1951. Appointment for a period of 6 months. Appointment is recognised for the D.Obst.R.C.O.G., and the salary will be £400 or £450 p.a., according to the number of posts held, with a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications with dates, and details of previous experience, together with copies of 3 recent testimonials, should be forwarded as soon as possible to M. D. KAY, Chief Administrative Officer at the Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (240 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, E.N.T. AND EYE HOUSE SURGEON post now vacant at above Hospital. Post is recognised for the D.L.O. and D.O.M.S. examinations. Salary £400 or £450 p.a., according to number of posts held, with a deduction of £100 for residential emoluments.

Applications, giving full particulars of qualifications and experience, with copies of 3 recent testimonials, should be forwarded as soon as possible to M. D. KAY, Chief Administrative Officer at the Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (240 Beds.) CANTERBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON to the General Surgical and Urological Departments, post vacant in the middle of January, 1951. Appointment limited to 6 months. Post is recognised for the F.R.C.S. Diploma, and the salary will be £400 or £450 p.a., according to the number of posts held, with a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications with dates, and details of previous experience, with copies of 3 recent testimonials, should be forwarded as soon as possible to M. D. KAY, Chief Administrative Officer at the Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds— Medical, Maternity, and Chronic Sick Beds, together with large Accident Unit and Casualty Department.) Required, RESIDENT HOUSE OFFICERS.

Applications, with copies of 2 testimonials, to the Secretary, Cardiff Hospital Management Committee, St. David's Hospital, Cardiff

CARDIFF. ST. DAVID'S HOSPITAL. Applications invited for post of RESIDENT HOUSE OFFICER (Pædiatric Unit).

Applications, with copies of 2 testimonials, to the Secretary, Cardiff Hospital Management Committee, St. David's Hospital, Cardiff.

CHESTER. UPTON MENTAL HOSPITAL. Psychiatric JUNIOR HOSPITAL MEDICAL OFFICER required. Salary £700–£50–£1000 p.a. Accommodation available for single Man and for which a charge will be made. All forms of modern treatment available, including Insulin Unit. There are psychiatric outpatient clinics at 3 General Hospitals, occupational therapy units and voluntary treatment wards. Facilities given to study for higher qualifications.

Apply Medical Superintendent.

CHESTERFIELD HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required in the specialty of Geriatrics for duty in 182 Bedded unit at Scarsdale and Penmore Hospitals, Chesterfield. Ministry of Health salary—£700–£50–£1000 p.a., less appropriate deduction where resident—and conditions of service.

Applications, stating age, qualifications, experience, &c., with the names of 3 referees, to—

M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.
Royal Hospital, Chesterfield.

CHELMSFORD AND ESSEX HOSPITAL. 2 House SURGEONS required, 1 to commence beginning of January and 1 beginning of February. Salary according to National Health Service scale.

Apply, Secretary, Hospital Management Committee, Chelmsford Group, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL, London-road, CHELMSFORD. JUNIOR REGISTRAR (Casualty Officer) required at above Hospital. To commence immediately. Salary according to National Health Service scale.

Apply to Secretary, Hospital Management Committee—Chelmsford Group, London-road, Chelmsford.

CHELMSFORD AND ESSEX AND ST. JOHN'S HOSPITALS. HOUSE SURGEON required to work at above Hospitals. Salary according to National Health Service scale.

Apply to Secretary, Hospital Management Committee—Chelmsford Group, London-road, Chelmsford.

COTTINGHAM, E. YORKS. CASTLE HILL HOSPITAL. (200 Beds—modern I.D. hospital with full laboratory facilities.) Whole-time HOUSE OFFICER (second or third post) required for duties under Consultant in I.D.

Detailed applications, with names of 3 referees, to be received by the Secretary, No. 5 Hospital Management Committee, Hull B Group, Castle Hill, Cottingham, E. Yorks., by 8th January, 1951.

DEWSBURY, BATLEY AND MIRFIELD HOSPITAL MANAGEMENT COMMITTEE. Required, JUNIOR HOSPITAL MEDICAL OFFICER in the specialty of pædiatrics. Post is resident and subject to 1 month's notice on either side. Duties to be carried out at hospitals in the Group. Salary according to national scale.

Applications, stating age, qualifications, and nationality, with names of 2 referees, should be forwarded to the Secretary, Dewsbury, Batley and Mirfield Hospital Management Committee, 20, Oxford-road, Dewsbury.

DEWSBURY. THE GENERAL HOSPITAL. House OFFICER (surgical), third or subsequent appointment, to assist Consultant Ophthalmic Surgeon. Recognition of the Hospital as a training centre for the Diploma in Ophthalmology is under consideration. Terms and conditions of service as laid down for hospital medical and dental staffs (England and Wales).

Applications, giving full particulars and names of 3 referees, to undersigned at 20, Oxford-road, Dewsbury.

G. W. BATCHELOR, Secretary,
Hospital Management Committee No. 11,
Dewsbury, Batley and Mirfield Group.

DARLINGTON MEMORIAL HOSPITAL. Required, RESIDENT ANÆSTHETIST (Male or Female). National Health Service superannuation regulations in force. Previous experience in anæsthesia an advantage, but not essential (trainee post).

Apply, with references and full details, forthwith to—

G. W. BECKWITH, Secretary,
Darlington District Hospital Management Committee.

DARLINGTON MEMORIAL HOSPITAL. Required, CASUALTY OFFICER (Male or Female). Salary in accordance with national scale.

Apply, with references, stating age and experience, to—

G. W. BECKWITH, Secretary.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL, The Ridgeway. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident or non-resident) in Radiology required immediately. 12 months' appointment. Salary £670 p.a., less £135 p.a. if resident. Conditions of service as prescribed by Ministry of Health. Superannuable post subject to medical examination.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to the Secretary of the Management Committee at Chase Farm Hospital by 5th January, 1951. Canvassing disqualifies.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. (515 Beds.) ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (second or third post), required 25th February, 1951, for general surgical duties. Post, which is tenable for 6 months, is recognised for the F.R.C.S. Salary and conditions as prescribed by the Ministry of Health. R practitioners holding first posts may apply.

Applications, stating age, nationality, qualifications, and experience, with the names of 2 referees, to the Medical Director of the Hospital by 24th January, 1951. Canvassing disqualifies.

DONCASTER ROYAL INFIRMARY. Applications invited from registered medical practitioners for the whole-time post of CASUALTY OFFICER at above Hospital in accordance with the terms and conditions of service for hospital medical and dental staffs. Salary at rate of £670 p.a., from which a deduction at rate of £130 p.a. will be made for residential emoluments.

Applications, stating age, education, qualifications, and details of present and previous appointments with dates, and giving names and addresses of 3 referees, should be forwarded to the undersigned immediately.

ARTHUR JONES, Secretary,
Doncaster Hospital Management Committee.
c/o Doncaster Royal Infirmary.

EPPING. ST. MARGARET'S HOSPITAL. (500 Beds.) Applications invited for the posts of:—

(*a*) HOUSE SURGEON (first post),
(*b*) HOUSE PHYSICIAN (first post),

at the above Hospital. Salary for each post on National Health Service scale—viz., £350 p.a., less a deduction at the rate of £100 p.a. for board and lodging and other services provided. The successful candidates will be required to take up their appointments in mid February, 1951.

Applications in writing together with copies of 2 recent testimonials to reach the Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, not later than 13th January, 1951.

EDINBURGH. BOARD OF MANAGEMENT FOR THE ROYAL INFIRMARY OF EDINBURGH AND ASSOCIATED HOSPITALS. Applications are invited for appointment as ASSISTANT MEDICAL SUPERINTENDENT (non-resident). Salary £950–£30–£1100. The appointment is subject to the passing of a medical examination and to the provisions of the National Health Service superannuation regulations. (Note: Appointments as Assistant Medical Superintendent are regarded primarily as training posts leading to an appointment as Medical Superintendent, and are not normally held for more than 5 years.)

Applications (15 copies of letter), stating age, and experience, and submitting the names of 3 referees, should be lodged with the undersigned not later than 15th January, 1951.

W. F. FERGUSON, Secretary and Treasurer.
Royal Infirmary of Edinburgh.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE OFFICER (medical) required. 6 months' appointment. Salary £350, £400, or £450 p.a., according to experience, less £100 p.a. for emoluments. Successful candidate will be required to commence on 1st February, 1951.

Applications, stating age, qualifications, and experience, with copies of 3 recent testimonials, to be sent as soon as possible to the Secretary at the above address.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL. Vacancy 1st January, 1951, for RESIDENT MEDICAL OFFICER for the Medical Unit of Great Yarmouth and Gorleston Hospitals. The Unit comprises 30 Beds for acute medical cases, fully equipped to undertake all types of medical treatment and investigations and is under the personal direction of a full-time Consultant. Post provides an excellent opportunity for a practitioner reading for a higher medical qualification. Salary £350–£450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, with 3 recent testimonials, should be sent to Secretary-Superintendent, Dene Side, Great Yarmouth, immediately.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. Applications are invited from registered medical practitioners (including practitioners within 3 months of qualification and liable under the National Service Acts) for the appointments of:—

HOUSE SURGEON, now vacant,
HOUSE SURGEON, vacant 25th January, 1951,

at the above Hospital and for service within the Hastings group of hospitals. Appointments for a period of 6 months. Salary will be within the scale £350–£400–£450 p.a., according to experience and posts held, less a deduction of £100 p.a. for full residential emoluments.

Applications to be sent to the Administrator, Royal East Sussex Hospital, Hastings.

H. A. FROGGATT, Secretary,
Hospital Management Committee (Hastings Group).
11, Holmesdale-gardens, Hastings.

HARROGATE ROYAL BATH HOSPITAL, Cornwall-road, HARROGATE. (146 Beds—a National Hospital for the treatment of rheumatic and allied diseases.) HARROGATE AND RIPON HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT MEDICAL OFFICER. This Hospital is recognised as having an authorised Physical Medicine Department, and time spent in the above post will afford good experience in physical medicine and orthopædics and will count towards the qualifying 12 months for the Diploma in Physical Medicine. Salary in accordance with the National Health Service scale, and subject to the National Health Service (Superannuation) Regulations, 1950. The appointment will be for a period of 6 months.

Applications to be forwarded to the Assistant Secretary, Royal Bath Hospital, Cornwall-road, Harrogate, immediately.

HOVE GENERAL HOSPITAL. Brighton and Lewes HOSPITAL MANAGEMENT COMMITTEE. Applications invited from registered medical practitioners (Male or Female) for the appointments of HOUSE PHYSICIAN, vacant 1st February, 1951, and HOUSE SURGEON, vacant 8th February, 1951, at the above Hospital. Appointments will be for a period of 6 months. Salary £350–£450 a year, according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, nationality, and experience, and accompanied by copies of 3 recent testimonials, should reach the Administrative Officer, Hove General Hospital, Hove, 3, before 3rd January, 1951.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (160 Beds.) Applications invited for following appointments:—

RESIDENT SURGICAL OFFICER (Male). 6 months' appointment. Salary £450 p.a., less £100 p.a. for residential emoluments.

HOUSE SURGEON (Male or Female). 6 months' appointment. Salary £350–£450 p.a., according to previous posts held, less £100 p.a. for residential emoluments.

Applications in writing, stating age, qualifications with dates, and nationality, with copies of 3 testimonials, to be sent immediately, addressed to the undersigned at Pembroke County War Memorial Hospital, Haverfordwest.

A. W. YOUNGS, Secretary,
West Wales Hospital Management Committee.

HALIFAX. ROYAL HALIFAX INFIRMARY. Required, HOUSE SURGEON (Male) to the Ophthalmic and E.N.T. Departments at this busy acute General Hospital. The post includes part-time casualty duty and is recognised for the D.O. and is vacant early January.

Applications, stating age, qualifications, and experience, with 3 recent testimonials, to be forwarded to the Secretary.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. (170 Beds.) WEST HERTS GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (second or third post), vacant 14th February, 1951. Salary and conditions of service in accordance with the National Health Service terms.

Applications, stating age, and giving full details of qualifications and previous experience, and accompanied by copies of 2 recent testimonials, should be submitted to the Administrator at the Hospital as soon as possible.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. (170 Beds.) WEST HERTS GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (second or third post), vacant 14th February, 1951. The post offers excellent experience in general medicine. Salary and conditions of service in accordance with the National Health Service terms.

Applications, stating age, and giving full details of qualifications and previous experience, and accompanied by copies of 2 recent testimonials, should be submitted to the Administrator at the Hospital as soon as possible.

HITCHIN, HERTS. THE LISTER HOSPITAL. (236 Beds.) Required, RESIDENT HOUSE SURGEON (first or second post) to commence 1st February, 1951. The appointment will be for 6 months in the first instance. Salary and conditions of service in accordance with National Health Service regulations.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, should be sent immediately to the Medical Director, The Lister Hospital, Hitchin.

HORNCHURCH, ESSEX. ST. GEORGE'S HOSPITAL. Required, JUNIOR HOSPITAL MEDICAL OFFICER. This Hospital at present accommodates chronic sick patients and offers excellent geriatric experience. The present beddage is for 268 chronic sick patients which will later be increased. Salary, &c., in accordance with nationally agreed terms and conditions of service for hospital medical and dental staffs.

Applications, stating (in order) age, nationality, qualifications with dates, present and previous appointments, and details of experience, should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, with copies of 2 most recent testimonials or names of 2 referees.

HULL. KINGSTON GENERAL HOSPITAL. (398 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE OFFICERS (1 medical, 1 surgical) are required at the above Hospital. Post is resident and tenable for 6 months. Salary £350, £400, or £450 per year, according to experience.

Applications should be addressed to the Administrative Officer at the above Hospital.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. ORTHOPÆDIC HOUSE SURGEON required, vacant now. National scale and conditions. 6 months' appointment, terminable at any time by 1 month's notice either side.

Forms of application from the Administrative Officer.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. HOUSE SURGEON required, vacant now. Recognised for F.R.C.S. National scale and conditions. 6 months' appointment, terminable at any time by 1 month's notice on either side.

Forms of application from the Administrative Officer.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. HOUSE SURGEON required in the E.N.T. Department at the Hull Royal Infirmary and the Victoria Hospital for Sick Children. Recognised for D.L.O. National scale and conditions. 6 months' appointment, terminable at any time by 1 month's notice on either side.

Forms of application from the Administrative Officer.

HULL ROYAL INFIRMARY. Hull A Group Hospital MANAGEMENT COMMITTEE. Applications invited for post of SECOND CASUALTY OFFICER (second or third post), vacant now. Salary in accordance with the national scale. 6 months' appointment, terminable at any time by 1 month's notice on either side.

Forms of application from the Administrative Officer.

HULL. DE LA POLE HOSPITAL, Willerby, near Hull. (1050 Beds.) Whole-time HOUSE OFFICER (second or third post), accommodation for single person only. Modern methods applied for treatment of mental diseases and nervous disorders.

Detailed applications, with names of 3 referees, to the Secretary, No. 5 Hospital Management Committee, Hull B Group, Castle Hill, Cottingham, E. Yorks, not later than 4th January, 1951.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) HOUSE SURGEON required to commence duties on 22nd February, 1951. Salary in accordance with terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with copies of 3 recent testimonials, to be addressed as soon as possible to—

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) HOUSE PHYSICIAN required to commence duty 22nd February, 1951. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs.

Applications, together with copies of 3 recent testimonials, should be addressed to—

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) HOUSE SURGEON required to commence duties on 27th January, 1951. Salary in accordance with terms and conditions of service for hospital medical and dental staffs, with full residential emoluments.

Applications, together with copies of 3 recent testimonials, to be addressed as soon as possible to—

H. J. JOHNSON, Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House OFFICER (second or third post), resident, to Department of Psychiatry. Previous medical experience essential and psychiatric experience an advantage. The department includes a neurosis centre and observation wards, and conducts an extensive outpatient service. Salary, terms, and conditions of service as approved for hospital medical staff.

Applications (endorsed "House Officer, Psychiatry, W.M.H."), stating age, nationality, qualifications, and experience, with copies of up to 3 recent testimonials, to the Secretary, South West Middlesex Hospital Management Committee, 1, Churchfield-road, Ealing, W.13, by 16th January, 1951.

ISLE OF MAN. NOBLE'S ISLE OF MAN HOSPITAL. Applications invited for post of SENIOR HOUSE SURGEON at above Hospital, which is an acute general hospital with a busy surgical practice and specialist visiting staff. Post will be remunerated at the level appropriate to that of a Junior Registrar under the terms and conditions of service of hospital medical and dental staffs (England and Wales), and would be suitable for a man reading for a higher surgical qualification. Previous hospital experience is, of course, essential.

Applications, giving all relevant particulars, with copies of 2 recent testimonials or names and addresses of 2 referees, should be forwarded to the Secretary, Noble's Isle of Man Hospital, Douglas.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. HOUSE SURGEON required 8th January, 1951. National salary scale.

Applications, with full particulars, to—

JOHN WILLIAMS, Secretary,
Ipswich Group Hospital Management Committee.

IPSWICH BOROUGH GENERAL HOSPITAL. RESIDENT ANÆSTHETIST HOUSE OFFICER required 17th January.

HOUSE SURGEON to General Surgeon required 2nd January. National salary scale.

Applications, with full particulars, to JOHN WILLIAMS, Secretary, Ipswich Group Hospital Management Committee at East Suffolk and Ipswich Hospital, Ipswich.

IPSWICH. EAST ANGLIAN REGIONAL HOSPITAL BOARD. RESIDENT SURGICAL OFFICER (Junior) at the East Suffolk and Ipswich Hospital and Ipswich Borough General Hospital (660 Beds). Salary £775–£890 p.a. The terms and conditions of service for hospital medical and dental staffs will apply. Appointment for 1 year, renewable for second year.

Applications, stating age, qualifications, and details of present and previous appointments, together with the names of 3 referees, should be sent to the undersigned not later than 15th January, 1951. Candidates are invited to visit the Hospital by direct arrangement with the Hospital Management Committee Secretary at the East Suffolk and Ipswich Hospital.

K. V. F. MORTON, Secretary.
117, Chesterton-road, Cambridge.

ILFORD. KING GEORGE HOSPITAL. There will be a vacancy for a HOUSE SURGEON (first, second, or third post) at above Hospital on 31st January, 1951. Salary will be £350 p.a. minimum and maximum £450, according to experience and qualifications, less emoluments. Post will be tenable for 6 months.

Applications, giving full particulars, and accompanied by testimonials, should be sent to the undersigned within 14 days of the appearance of this advertisement.

G. AUSTIN HEPWORTH, Secretary, Ilford and
Barking Group Hospital Management Committee.
King George Hospital, Ilford.

LEIGH INFIRMARY, Leigh, Lancs. Required, House SURGEON at the above Hospital, which is a busy general hospital of 102 Beds. Appointee will be attached to the Surgical and Orthopædic Wards and will be required to undertake some duties in the Casualty Department along with other members of the resident staff. Salary and conditions of service in accordance with the terms laid down for hospital medical and dental staffs.

Applications, stating age, nationality, qualifications, and previous hospital appointments, together with the names of 2 referees, should reach the undersigned immediately.

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan.

KETTERING AND DISTRICT GENERAL HOSPITAL. (129 Beds, plus 40-Bed Annexe.) Required, SENIOR HOUSE SURGEON. 4 residents on staff. Salary £350–£450, according to experience, less £100 board-residence. Appointment for 6 months in the first instance, and post is now vacant.

Applications, with copies of 1–3 testimonials, to be sent as soon as possible to—

G. H. FENNELL, Assistant Secretary,
Kettering and District Hospital Management Committee.

LEEDS, 12. ST. MARY'S HOSPITAL. Locum Resident OBSTETRIC OFFICER (Registrar) required at the above Hospital. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £775 or £890 p.a., according to previous service in the grade, with an appropriate deduction in respect of board, lodgings, and other services provided.

Forms of application, available from the undersigned, should be completed and returned as soon as possible.

J. FOLKARD, Secretary,
Leeds A Group Hospital Management Committee.
Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS. THE UNITED LEEDS HOSPITALS. General INFIRMARY AT LEEDS. Applications are invited for the post of RADIOTHERAPEUTIC REGISTRAR in the National Radiotherapy Centre at Leeds. The vacancy is for a Registrar or Senior Registrar and candidates must possess the D.M.R.T.

Applications, stating age, nationality, experience, together with the names of not more than 3 referees, to be sent to the undersigned not later than 10 days after the appearance of this advertisement.

S. CLAYTON FRYERS, Secretary to the Board.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the post of SENIOR REGISTRAR in Anæsthetics for duties mainly at the Thoracic Surgery Unit at Castle Hill Sanatorium, Cottingham, near Hull. As a temporary measure the successful candidate will, if necessary, be seconded to Leeds General Infirmary and Pinderfields General Hospital, Wakefield, for training. The appointment will be subject to the National Health Service (Superannuation) Regulations, 1950, and the salary will be in accordance with the terms and conditions of service of hospital medical and dental staffs.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names of 3 referees, should be forwarded to the Secretary, 29/31, Eastgate, Leeds, 2, not later than 20th January, 1951. Canvassing in any form, either directly or indirectly, will disqualify.

LEEDS REGIONAL HOSPITAL BOARD invites applications for 2 REGISTRAR appointments in the specialty of chest diseases. Initial duties will be with the Mass Radiography Service in Hull and Bradford respectively, under the immediate supervision of the senior chest physician in the area. Ample facilities will also be given for clinical work at the parent chest clinic, attendance at sanatoria and general hospitals, &c. After a satisfactory term in mass radiography, suitable candidates will be considered for a further period of training in selected Regional sanatoria. These are essentially trainee specialist posts, and only applicants possessing a first-rate clinical background in chest work will be considered. The appointments will be subject to the provisions of the National Health Service (Superannuation) Regulations, 1950, and the salaries and conditions of service will be in accordance with the terms and conditions of hospital medical and dental staffs.

Applications, stating age, experience, qualifications, and present appointment, together with the names of 3 referees, to be forwarded to the Secretary to the Board, 29/31, Eastgate, Leeds, 2, not later than 27th January, 1951. Canvassing in any form, either directly or indirectly, will disqualify.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Required, RESIDENT HOUSE SURGEON (second or third post), E.N.T. and Ophthalmic Departments, post now vacant. Tenable for 6 months. Salary according to number of previous posts held, and conditions of service in accordance with terms and conditions of service of hospital medical staff.

Applications to be sent as soon as possible to—

Miss V. WELLS, Assistant Secretary.

LENNOXTOWN. LENNOX CASTLE INSTITUTION. (Beds 160.) HOUSE OFFICER required for Maternity Unit at above. Commence duties 1st February, 1951.

Further inquiries from, and applications to, Physician-Superintendent, Lennox Castle Institution, Lennoxtown.

LINCOLN. BRACEBRIDGE HEATH HOSPITAL (for Mental Diseases). (1221 Beds.) LINCOLN NO. 2 HOSPITAL MANAGEMENT COMMITTEE. LOCUM TENENS required for 3 months from January to March, 1951. Salary 15 guineas per week. There is residential accommodation for a single person, if desired.

Applications, with names of 3 referees, should be forwarded as soon as possible to the Medical Superintendent, Bracebridge Heath Hospital, near Lincoln.

LYMINGTON AND DISTRICT HOSPITAL, Lymington, HANTS. HOUSE PHYSICIAN AND HOUSE SURGEON required, posts vacant 16th and 31st January respectively. Tenable for 6 months. Salary £350–£450 p.a., according to number of posts previously held, less £100 p.a. for residential emoluments. Terms and conditions of service as laid down by Ministry of Health.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

MANSFIELD. HARLOW WOOD ORTHOPÆDIC HOSPITAL, near MANSFIELD, NOTTS. (340 Beds.) Required, RESIDENT HOUSE SURGEON (second or subsequent post). Salary in accordance with National Health Service scale.

Applications, stating age, qualifications, experience, and enclosing copies of 2 recent testimonials, to be sent to Secretary

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE (GROUP 13). Required, SENIOR HOUSE SURGEON in the E.N.T. Department at the above Hospital, which is recognised by the Royal College of Surgeons for the purposes of the D.L.O. Appointment for 12 months. Salary £670 a year, less £150 a year for residential emoluments, in accordance with the terms and conditions of service of hospital medical and dental staffs. Suitably qualified R practitioners holding second and third House Officer posts are invited to apply.

Applications, stating age, nationality, qualifications, experience, together with the names and addresses of 2 responsible persons to whom reference may be made as to professional ability and character, should be sent as soon as possible to the Secretary, Mid-Kent Hospital Management Committee, 103, Tonbridge-road, Maidstone, as soon as possible.

MANCHESTER. NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE invite applications from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (orthopædics), vacant as from 1st January, 1951, with duties at Crumpsall Hospital and other hospitals within the group. Salary and conditions of service in accordance with the terms and conditions of service of hospital medical staff.

Applications, stating age, qualifications and dates, particulars of previous appointments with dates, with the names and addresses of 2 referees, to be sent as soon as possible to—

A. T. SAMPSON, Secretary to the Committee.

Crumpsall Hospital, Manchester, 8.

MANCHESTER UNITED HOSPITALS. Manchester ROYAL EYE HOSPITAL. Required, HOUSE SURGEON. Salary £350–£450 p.a., according to the number of positions previously held, less £100 p.a. for residential emoluments. Appointment of a practitioner within 3 months of qualification and subject to National Service Acts would be limited to 6 months.

Applications, stating age, details of qualifications and experience, and nationality, should be forwarded immediately to H. R. NORTH, General Superintendent.

MANCHESTER, 4. ANCOATS HOSPITAL. Applications are invited for the posts of :—

HOUSE SURGEON to the Orthopædic and Fracture Department.

HOUSE SURGEON to the E.N.T. Department.

Vacancies exist as from 1st February, 1951.

Applications, stating age, experience, and names and addresses of 2 referees, to be addressed to the undersigned (Dept. T.L.) as soon as possible. JOHN H. DAFFORNE,

General Superintendent and Secretary.

NOTTINGHAM GENERAL HOSPITAL. Required, JUNIOR CASUALTY OFFICER (first post), Male or Female, for the above Hospital. Duties to commence as soon as possible. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, and nationality, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary,

Nottingham No. 1 Hospital Management Committee.

NOTTINGHAM GENERAL HOSPITAL. Required, JUNIOR AURAL REGISTRAR (resident), duties to commence immediately. Salary and conditions of service to be in accordance with the published conditions of the National Health Service. The E.N.T. Department has 53 Beds and a large Outpatient Department and is recognised for the D.L.O.

Applications to be addressed to undersigned, stating age, qualifications, and experience, with copies of testimonials.

HENRY M. STANLEY, Secretary,

Nottingham Area No. 1 Hospital Management Committee.

NOTTINGHAM GENERAL HOSPITAL. Required, HOUSE SURGEON (Male or Female) for above Hospital. If held by an R practitioner appointment will be for 6 months. Salary and conditions of service in accordance with the published conditions of the Ministry of Health, less £100 p.a. for emoluments. Duties to commence on or about 2nd January, 1951.

Applications, stating age, qualifications, and experience, with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary,

Nottingham No. 1 Hospital Management Committee.

NOTTINGHAM GENERAL HOSPITAL. (439 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Applications invited for the resident post of Whole-time SENIOR SURGICAL REGISTRAR to the above Hospital. Candidates should have a good general medical and surgical background and must be in possession of the Fellowship of one of the Royal Colleges of Surgeons. The appointment is for 1 year in the first instance, reviewable annually. Salary and conditions of service will be in accordance with the terms and conditions of service issued by the Ministry of Health.

Applications, giving age, nationality, qualifications, present and previous appointments with dates, together with names and addresses of 3 referees, should be sent to the Secretary, Sheffield Regional Hospital Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to reach him not later than 27th January, 1951.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT GYNÆCOLOGICAL HOUSE SURGEON to the Department of Obstetrics and Gynæcology (30 Beds). The duration of the appointment will be for 6 months. Salary is in accordance with the terms and conditions of the National Health Service—£400–£450 p.a., according to experience. The department is recognised by the Royal College of Obstetricians and Gynæcologists for the Diploma of M.R.C.O.G., and D.Obst. R.C.O.G., and undertakes the training of medical students. Post is vacant on the 1st February, 1951.

Applications should be sent without delay, together with 1 copy of 2 recent testimonials or the names and addresses of 2 referees, to the Medical Superintendent, Newcastle General Hospital, 418, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. (959 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female), including R practitioners within 3 months of qualification, for the following resident posts which become vacant on the 1st February, 1951. The appointments are tenable for 6 months :—

HOUSE PHYSICIANS.
HOUSE SURGEONS.
HOUSE PHYSICIANS to Neurosurgical Unit.
HOUSE SURGEON to Urological Unit.
HOUSE SURGEONS to Accident Room.
HOUSE PHYSICIAN to Children's Department. This department is actively associated with and shares staff with the Department of Child Health of Durham University, and the post offers exceptional opportunities for gaining experience in many aspects of pædiatrics.

Salary according to terms and conditions of service of hospital medical and dental staffs (England and Wales).

Applications, together with 1 copy of 2 testimonials, should be sent as soon as possible to the Medical Superintendent, Newcastle General Hospital, 418, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Required, Whole-time RESIDENT MEDICAL OFFICER. The appointment is particularly suitable for a candidate preparing for, or who has recently achieved a higher degree in medicine. The successful candidate will be responsible for admission of patients to the medical wards, medical advice as required in the Accident Room, medical attention to nursing and domestic staffs and may be attached to one of the medical clinics in the Royal Victoria Infirmary. The appointment which will be at the level of Senior Registrar will be for 1 year renewable to a maximum of 3 years and will be subject to Ministry of Health terms and conditions of service. The salary for the first year will be at rate of £1000 p.a., less an appropriate deduction for residential emoluments. The duties should commence as soon as possible.

Applications, giving age, nationality, experience, and qualifications, with names and addresses of 3 referees, should be sent to the undersigned within 7 days of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Applications are invited from registered medical practitioners for the appointment of Whole-time SENIOR REGISTRAR to the Anæsthetics Department. This is the teaching hospital of the University of Durham, and the successful candidate will be required to work mainly in the Royal Victoria Infirmary. Possession of a Diploma in Anæsthetics is not essential, but candidates must have had experience in the specialty. The appointment which will be at the level of Senior Registrar will be for 1 year in the first instance, and will be subject to Ministry of Health terms and conditions of service. The salary for the first year will be at the rate of £1000 p.a.

Applications, giving age, nationality, experience, and qualifications, with the names and addresses of 3 referees, should be sent to the undersigned within 7 days of the date of appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.

Royal Victoria Infirmary, Newcastle upon Tyne.

NEWPORT, MON. ROYAL GWENT HOSPITAL. (259 Beds.) Required, JUNIOR HOSPITAL MEDICAL OFFICER in the E.N.T. and Ophthalmic Departments. Appointment recognised for the D.L.O. Salary £700–£50–£1000 p.a., less a deduction of £120 for full residential emoluments.

Apply, with names of 2 persons for reference, to—

17, Cardiff-road, Newport. T. A. JONES, Secretary.

NORTHAMPTON. MANFIELD ORTHOPÆDIC HOSPITAL. (200 Beds.) NORTHAMPTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Required, ORTHOPÆDIC SENIOR HOUSE OFFICER (resident), post vacant early in January. The appointment will be for 1 year. Salary £670 p.a., with a deduction at rate of £100 p.a. for residential emoluments. The post will provide experience in a wide range of orthopædic treatment, including outpatient clinics.

Applications, stating age, nationality, qualifications, and experience, together with copies of testimonials, should be sent immediately to the Secretary, Northampton and District Hospital Management Committee, General Hospital, Northampton.

ORMSKIRK. COUNTY HOSPITAL, Wigan-road. (400 Beds.) Applications invited for following appointments, tenable for 6 months :—

HOUSE SURGEON (general surgery).
HOUSE SURGEON with casualty duties.

Both vacant immediately. Salary £350–£450 p.a., according to experience, with a deduction of £100 p.a. for residential emoluments. This is a general hospital providing facilities in several specialties, with a full Consultant Staff. The Hospital is within easy reach of Liverpool and Southport.

Applications, with full details, should be forwarded as soon as possible to— H. E. BECK, Secretary, Ormskirk and District Hospital Management Committee.

County Hospital, Ormskirk, Lancs.

READING. ROYAL BERKSHIRE AND BATTLE HOSPITALS. Required, RESIDENT JUNIOR REGISTRAR (Male) to the Accident and Orthopædic Departments of above Hospitals, post vacant 18th December, 1950. Duties will include work in the Casualty Departments. Salary £670, less £100 for board-residence. Appointment subject to terms and conditions of service as published by the Ministry of Health.

Applications, stating age, nationality, qualifications with dates, previous experience, with names of 2 referees, should be sent to the Chief Administrative Officer, Reading and District Hospital Management Committee, 3, Craven-road, Reading, Berks, immediately.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MON. (115 Beds.) Required, HOUSE OFFICER (medical), post vacant from 1st February. Appointee will work under the directions of the Consultant Physician and the Paediatrician. Salary £350–£450 p.a., in accordance with the number of previous posts held, less a deduction of £100 p.a. for full residential emoluments.

Apply, with names of 2 persons for reference, to—
17, Cardiff-road, Newport, Mon. T. A. JONES, Secretary.

PRESTON ROYAL INFIRMARY. Casualty Officer, vacant January, 1951. Salary in accordance with National Health Service scale—£350–£450 p.a., with a deduction of £100 p.a. for residential emoluments.

Applications, stating age, experience, &c., with copies of recent testimonials, to be sent to the undersigned at the Royal Infirmary, Preston.

JOHN GIBSON, Secretary, Preston and
Chorley Hospital Management Committee.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Freedom Fields. Required, CASUALTY AND RECEIVING ROOM OFFICER, post now vacant. The responsibility of this post will carry with it the status of Junior Surgical Registrar. Post is resident and subject to the National Health Service superannuation regulations. Appointment for 1 year at a salary of £670 p.a.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 testimonials, should be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Secretary, Plymouth, South Devon
and East Cornwall General Hospital Group.
Head Office, Greenbank-road, Plymouth.

RAWTENSTALL. ROSSENDALE GENERAL HOSPITAL. There is a vacancy for JUNIOR MEDICAL REGISTRAR (resident) at above Hospital. Salary and conditions of service in accordance with those laid down for hospital medical staff (England and Wales). Hospital is at present in the process of being upgraded and will provide approximately 40 acute medical beds, and in addition there will be responsibility for certain chronic sick wards. Successful applicant required to work under the direction of the Consultant Physician.

Applications, giving full particulars as to qualifications and experience, with copies of recent testimonials, should be made immediately to— H. WILKINSON, Secretary,
Bury and Rossendale Hospital Management Committee.
Bury General Hospital, Bury, Lancs.

RAMSGATE. THE GENERAL HOSPITAL. (101 Beds.) ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON. Appointment will be for a period of 6 months. Salary at rate of £350 p.a., less £100 for residential emoluments. R practitioners within 3 months of qualification may apply.

Applications, stating age, and qualifications, together with copies of 3 recent testimonials, should be sent as soon as possible to the Administrator, The General Hospital, Ramsgate.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (572 Beds.) Required, RESIDENT HOUSE SURGEON (House Officer grade). Appointment for a period of 6 months and is now vacant. The work is principally in connection with orthopædic and fracture cases and includes other general surgical duties. Salary according to previous appointments held.

Applications, stating age, qualifications with dates, experience, &c., and accompanied by copies of 2 recent testimonials, should be addressed to the undersigned at the Hospital by 6th January, 1951. J. C. FIELD, Secretary,
Southend-on-Sea Hospital Management Committee.
Management Committee Offices, General Hospital,
Rochford, Essex.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (238 Beds.) Applications invited from registered medical practitioners (Male) for post of HOUSE SURGEON, vacant at above Hospital on 24th January, 1951. Resident post tenable for 6 months. Salary, &c., as per Ministry of Health scale for House Officers according to previous posts held, less £100 a year for board and lodging, &c.

Applications, stating age, qualifications with dates, and experience, with copies of 2 testimonials of recent date or names of 2 referees, should be forwarded to the Secretary, Romford Group Hospital Management Committee at Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (718 Beds.) Required, JUNIOR REGISTRAR in Pathology in this large General Hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience. Salary and conditions of service as published by the Ministry of Health.

Applications, stating age, nationality, qualifications with dates, present and previous appointments, and details of experience, together with copies of 2 testimonials of recent date or names of 2 referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, Essex.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD invite applications for the post of JUNIOR HOSPITAL MEDICAL OFFICER, Ross Memorial Hospital, Dingwall. The Hospital admits general medical and surgical cases, and has a maternity unit, and outpatient clinics are held by Visiting Consultants. The post is non-resident, and the salary is in accordance with the scale of £700–£50–£1000. Applicants should have previous experience in obstetrics in hospital or general practice.

The schedule of application and further particulars of the post may be obtained from the undersigned, with whom applications should be lodged by 15th January, 1951.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore Hospital, Inverness.

SALFORD. HOPE-LADYWELL HOSPITALS. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the vacancy of SENIOR HOUSE OFFICER (medical) which exists at Hope-Ladywell Hospitals. Successful candidate will be required to carry out duties at both hospitals. Salary £670 p.a. Conditions of service as laid down under the National Health Service Act.

Applications, stating qualifications, age, and experience, together with the names of 3 referees, should be addressed to the Superintendent, Hope Hospital, Salford, 6, to arrive not later than 14 days after the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL (Salisbury Infirmary and Odstock Hospital). (470 Beds.) Required, RESIDENT HOUSE SURGEON to the E.N.T. Department, which consists of 40 Beds, together with busy Outpatient and Audiometric Clinics. Appointment now vacant and for 6 months. Salary and conditions of service in accordance with the terms for medical staff in hospitals.

Applications, with copies of 2 recent testimonials, should be sent to the Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, immediately.

SHREWSBURY. ROYAL SALOP INFIRMARY. (240 Beds.) Required, ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER (Male or Female), vacant immediately. Salary £350–£450 p.a., less a deduction of £100 p.a. for residential emoluments.

Applications, stating age, qualifications, nationality, and experience, accompanied by copy testimonials, should be sent to the Secretary, Group 15 Hospital Management Committee, Royal Salop Infirmary, Shrewsbury.

J. P. MALLETT, Secretary.
Royal Salop Infirmary, Shrewsbury, 23rd September, 1950.

SHEFFIELD. CITY GENERAL HOSPITAL. Required, RESIDENT JUNIOR SURGICAL REGISTRAR for the Thoracic Unit, post vacant 1st March, 1951. Preference will be given to candidates with experience in chest diseases and holding a higher qualification.

Forms of application may be obtained from the undersigned at Nether Edge Hospital, Sheffield, 11, and must be returned not later than the 10th January, 1951.

W. STANSFIELD, Secretary,
Sheffield No. 1 Hospital Management Committee.

SHEFFIELD. NETHER EDGE HOSPITAL. Required, HOUSE OFFICER. Principal duties will be in connection with the Maternity Department which deals with approximately 1000 cases p.a. (a new Maternity Unit has just been opened), but the Officer will also be required to assist in the Medical Wards (at present approximately 200 Beds Chronic Sick).

Forms of application may be obtained from the undersigned at Nether Edge Hospital, Sheffield, 11.

W. STANSFIELD, Secretary,
Sheffield No. 1 Hospital Management Committee.

SHEFFIELD NO. 1 HOSPITAL MANAGEMENT COMMITTEE invite applications for the non-resident appointment of ASSISTANT PATHOLOGIST at the City General Hospital, Sheffield, and associated laboratories including the Regional Blood Transfusion Centre. Previous laboratory experience will be an advantage. Salary £700–£50–£1000 p.a. The appointment will be for a period not exceeding 3 years in the first instance.

Forms of application may be obtained from the undersigned at Nether Edge Hospital and must be returned not later than 9th January, 1951. W. STANSFIELD, Secretary.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. GENERAL PRACTITIONER SPECIALISTS. Applications are invited from registered medical practitioners for General Practitioner sessions at the under-mentioned hospitals under the South-Western Regional Hospital Board :—

1 session in General Surgery, Crewkerne Hospital.
1 session in Anæsthetics, Wincanton Hospital.
2 sessions in Anæsthetics, Clevedon Hospital.
2 sessions in Anæsthetics, Chippenham Hospital.
2 sessions in Anæsthetics, Trowbridge Hospital.
3 sessions in Anæsthetics, Wells and District Hospital.
5 sessions in Anæsthetics, Lydney and District Hospital, Dilk Memorial Hospital, Cinderford.
2 sessions in Dermatology, Gloucestershire Royal Hospital.

The practitioners appointed will be required to undertake sessions only at the hospitals mentioned, and previous experience in the specialty concerned is essential. Payment will be at the rate of £175 p.a. per weekly 3½-hour session. The appointments are superannuable and are in accordance with the terms and conditions of service of hospital medical and dental staffs. Applicants should state the number of hours work per week they would be willing to undertake, and also the hospital or hospitals in which they would be prepared to work. Applicants should also state whether they are engaged in general practice and, if so, the number of patients on their National Health Service list.

Applications (2 copies), stating date of birth, qualifications, and experience, together with the names and addresses of 2 referees, should be addressed to the Secretary of the Regional Hospital Board, 5, Cotham Lawn-road, Bristol, 6, so as to reach him not later than 13th January, 1951. Canvassing will disqualify.

SOUTHAMPTON. ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL. (290 Beds.) Required, ORTHOPÆDIC HOUSE SURGEON (resident), post vacant 31st December, 1950. Tenable for 6 months. This Hospital provides a comprehensive orthopædic service and is the centre to which all trauma from a large industrial town and port is directed. Salary £350–£450 p.a., according to number of posts previously held, less £100 p.a. for residential emoluments. Terms and conditions of service as laid down by the Ministry of Health.

Applications, with copies of testimonials, to be submitted to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL. (290 Beds.) HOUSE SURGEONS (3) required. Posts vacant December and mid-January. Tenable for 6 months. Salary £350–£450 p.a., according to number of posts previously held, less £100 p.a. for residential emoluments. Terms and conditions of service as laid down by the Ministry of Health.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON BOROUGH GENERAL HOSPITAL. HOUSE SURGEON (resident) required immediately. Post tenable for 6 months. Salary £350–£450 p.a., according to number of posts previously held, less £100 p.a. for residential emoluments. Terms and conditions of service as laid down by the Ministry of Health.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON BOROUGH GENERAL HOSPITAL. HOUSE PHYSICIAN required, post vacant mid-January. Tenable for 6 months. Salary £350–£450 p.a., according to number of posts previously held, less £100 p.a. for residential emoluments. Terms and conditions of service as laid down by the Ministry of Health.

Applications, with copies of testimonials, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON INFECTIOUS DISEASES HOSPITAL AND SANATORIUM. HOUSE OFFICER (Male or Female) required at end of the year. Salary £350–£450 p.a., according to experience, less £100 p.a. for residential emoluments. Terms and conditions of service in accordance with those nationally advocated.

Applications, with copies of references, to be submitted as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

STAMFORD AND RUTLAND HOSPITAL. (105 Beds.) SENIOR HOUSE SURGEON (resident). Commencing salary £670 p.a., less £140 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and nationality, with names of 3 referees, to be addressed to the Secretary, Stamford and Rutland Hospital, Stamford, Lincs.

STAMFORD AND RUTLAND HOSPITAL. (105 Beds.) Required, HOUSE OFFICER (surgical). Salary £350–£450 p.a., according to number of posts held, from which a deduction at rate of £100 p.a. made in respect of residential emoluments. Appointment, starting immediately, for 6 months in the first instance.

Applications, stating age, qualifications, nationality, with copies of recent testimonials, should be forwarded to the Secretary, Stamford and Rutland Hospital, Stamford, Lincolnshire.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—230 Beds ; 7 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT SENIOR HOUSE SURGEON to the Orthopædic and Traumatic Department, post now vacant. This is a large and busy specialty with 2 Consultants, 70 Beds, and deals with the greater part of the casualties in West Cornwall. Post is tenable for 1 year at a salary of £670, less £100 emoluments and subject to the regulations of the Ministry of Health.

Applications, stating age, nationality, qualifications and experience, and accompanied by copies of 2 recent testimonials, should be forwarded to the Administrative Assistant without delay.

TRURO. ROYAL CORNWALL INFIRMARY. (General Hospital—230 Beds ; 7 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Required, CASUALTY HOUSE SURGEON (Male or Female), post vacant now. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, enclosing copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

TRURO. ROYAL CORNWALL INFIRMARY. (230 Beds— 7 Residents.) WEST CORNWALL HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (Male or Female), for General Surgery and Gynæcology, post vacant now. Successful candidate will be responsible jointly with the House Surgeon for the 74 Beds allocated to the 2 specialties. Salary and conditions of service in accordance with the terms laid down by the Ministry of Health.

Applications, enclosing copies of 2 recent testimonials, should be sent to the Administrative Assistant, Royal Cornwall Infirmary, Truro.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. Required, HOUSE SURGEON at the above Hospital. The salary for this appointment is in accordance with the terms and conditions laid down for hospital medical and dental staffs.

Applications, stating age, nationality, qualifications, and previous medical appointments, together with the names of 2 referees, should be received by the undersigned as soon as possible.

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan, 19th December, 1950.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. RESIDENT ANÆSTHETIST required at above Hospital. Appointment in accordance with terms and conditions of service for hospital medical and dental staffs, and £100 p.a. will be charged for residential accommodation.

Applications, stating age, nationality, qualifications, and previous hospital appointments, with names of 2 referees, should be forwarded as soon as possible to—

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan, 19th December, 1950.

TAPLOW, MAIDENHEAD, BERKS. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required, post vacant 27th January. Salary on national scale.

Applications, giving details of age, experience, and qualifications with dates, together with copies of 2 testimonials, should be forwarded immediately to the Administrative Officer.

TAPLOW, MAIDENHEAD, BERKS. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for Research in Juvenile Rheumatism, vacant 18th February. Post offers scope for those interested in research, pædiatrics, rheumatology, or cardiology, and previous experience in one of these is desirable. Salary on national scale.

Applications, stating age, qualifications, and experience, with dates, and copies of 2 testimonials, to be sent to the Administrative Officer.

WIGAN. BILLINGE HOSPITAL, Orrell, near Wigan. Required, OBSTETRICAL HOUSE OFFICER at the above Hospital, post vacant 1st February, 1951. The appointment is a resident one, and salary is in accordance with the terms laid down for hospital medical and dental staffs, less £100 p.a. for residential emoluments.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded not later than the 11th January, 1951, to—

T. W. HURST, Secretary,
Wigan and Leigh Hospital Management Committee.
Knowsley House, Wigan, 19th December, 1950.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (326 Beds.) WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to the Orthopædic Department, vacant immediately. Salary at the rate of £350, £400, or £450 a year, according to experience, less £100 for board and residence.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON to the Senior Surgeon, vacant 1st January, 1951. Salary £350, £400, or £450 a year, according to experience, less £100 for board and residence.

Applications, with copies of 2 testimonials, should be sent to the Secretary.

WHISTON. COUNTY HOSPITAL. (880 Beds.) Required, RESIDENT HOUSE PHYSICIAN. 6 months' appointment. Salary £350–£450 p.a., according to experience, less £100 for residential emoluments.

Applications to be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston,
near Prescot, Lancs.

WHISTON. COUNTY HOSPITAL. (880 Beds.) Required, RESIDENT HOUSE SURGEON. 6 months' appointment. Salary £350–£450 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications to be forwarded to the undersigned as soon as possible.

N. RICHARDS, Secretary, St. Helens and
District Hospital Management Committee.
Group Office, County Hospital, Whiston,
near Prescot, Lancs.

WAKEFIELD. GENERAL HOSPITAL, Park Lodge-lane. Required, HOUSE PHYSICIAN for the Medical Unit and with some anæsthetic duties and to work under the supervision of the Medical Superintendent, appointment vacant immediately, The post is resident and the salary scale £350–£450 p.a., according to experience, less £100 as residential emoluments.

Applications should be addressed to the Medical Superintendent.

W. READ, Secretary, Hospital
Management Committee No. 9, Wakefield A Group.

WORCESTER. POWICK MENTAL HOSPITAL, near WORCESTER. SOUTH WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE. Locum Tenens MEDICAL OFFICER ; of Registrar status required at above Hospital. Experience of mental hospitals not essential but desirable. Salary and conditions in accordance with the terms for hospital medical staff.

Apply as soon as possible, stating full particulars, together with names of 2 referees, to the Medical Superintendent.

WOLVERHAMPTON HOSPITAL MANAGEMENT COM-MITTEE, GROUP NO. 16, BIRMINGHAM REGION. Applications invited from registered medical practitioners for following appointments :—

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

JUNIOR CASUALTY OFFICER, vacant now.
HOUSE SURGEON (Fracture and Orthopædic Department), vacant now.
SENIOR HOUSE OFFICER (Fracture and Orthopædic Department), vacant 24th December.
HOUSE SURGEON (Ear, Throat and Nose Department), vacant 31st December.
SENIOR HOUSE OFFICER (Ear, Throat and Nose Department), vacant 1st February, 1951.
HOUSE PHYSICIAN, vacant shortly.
HOUSE PHYSICIAN (pædiatric), vacant shortly.
HOUSE SURGEONS (general surgery), vacant shortly.

The Royal Hospital (Women's Branch), recognised for the examination of M.R.C.O.G.

RESIDENT MEDICAL OFFICER, vacant shortly.

New Cross Hospital, Wolverhampton

HOUSE PHYSICIAN, vacant 1st February, 1951.

All appointments subject to terms and conditions of service issued by the Ministry of Health.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the following posts :—

County Hospital, York (General Hospital of 269 Beds)
City Hospital, York (Modern General Hospital of 265 Beds)

E.N.T. HOUSE SURGEON. The E.N.T. Department which is mainly at the County Hospital, York, has approximately 30 Beds, is recognised for the D.L.O., and offers excellent opportunities for learning the specialty. The appointment is for 6 months initially, previous experience preferable but not essential. Post vacant from 16th January, 1951. Salary £400 for second post held, £450 for third post, less £100 for residence.

County Hospital, York (General Hospital of 269 Beds with full Consultant staff)

CASUALTY OFFICER (with charge of Orthopædic Beds). Post is graded House Officer (second, third, or subsequent post) and is vacant on 17th January, 1951, for 6 months. Salary £400 for second post, £450 for third or subsequent posts, less £100 for residence. Residential accommodation is available, but special arrangements can be made if the applicant wishes to be non-resident or partly resident.

Maternity Hospital, York (44 Beds)

RESIDENT OBSTETRIC HOUSE SURGEON. There are 2 House Surgeons at the Maternity Hospital and appointment will be as Junior House Surgeon for 4 months and Senior House Surgeon for 2 months. Previous obstetric experience is desirable but not essential and post is vacant from 1st February, 1951. The post is recognised for the Diploma in Obstetrics. Salary £400 p.a. for second post held, £450 for third post, less £100 for residence.

County Hospital, York (General Hospital of 269 Beds)
City Hospital, York (modern General Hospital of 265 Beds)
Yearsley Bridge Hospital, York (Infectious Diseases Hospital of 86 Beds)

JUNIOR HOSPITAL MEDICAL OFFICER (pædiatrics and infectious diseases) to spend approximately half of time in connection with pædiatric duties at the County Hospital (22 pædiatric beds), City Hospital (32 pædiatric beds), and other hospitals in the group, and approximately half of time at Yearsley Bridge Hospital. Candidates should have had previous experience of pædiatrics and infectious diseases. Preference will be given to the holders of the D.C.H. The post is vacant immediately and the appointment is for 1 year in the first instance. Residential accommodation available ; otherwise applicant will be required to live near Hospital. Salary £700–£50–£1000, with deduction if resident. Terms and conditions of service are those laid down by the Minister of Health.

Applications, giving details of age, nationality, qualifications, and experience, together with the names of 2 referees, to be forwarded immediately to—

F. A. MILNES, F.H.A., A.L.A.A., Secretary,
York A and Tadcaster Hospital Management Committee.
Bootham Park, York.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a whole-time post as REGISTRAR in Radiotherapy, with such duties at Hospitals in Northern Ireland as the Authority may require. Applicants must hold a higher qualification in medicine or surgery. The successful candidate will receive training in radiotherapy at Manchester or at other centres in Great Britain as may be arranged by the Authority. The appointment will in the first instance be for the period ending 30th September, 1951, and may be made in the grade of Principal Registrar, the analogous grade in Great Britain being Senior Registrar. Remuneration will be on the following scale : Principal Registrar £1000 p.a. for first year, £1100 p.a. for second year, £1200 p.a. for third year, £1300 p.a. for any subsequent year. The commencing salary will be determined by reference to the experience and qualifications of the successful applicant. A charge will be made for any accommodation and services provided in connection with the post. Contributions will be payable under the Health Services superannuation scheme. It is the Authority's policy to give preference to candidates who have served in H.M. Forces in war-time.

Applications should be made on a form, which may be obtained (together with further details of the post) from the Secretary, Northern Ireland Hospitals Authority, Friends' Provident Buildings, 58, Howard-street, Belfast, and which must be returned so as to be received not later than 15th January, 1951. Canvassing by or on behalf of an applicant will disqualify. Any approach to a member of the Authority by or at the request of a candidate for the purpose of obtaining support for his application will be treated as canvassing.

NEW JERSEY. ST. ELIZABETH HOSPITAL, 204, South Broad-street, ELIZABETH 2, N.J. Large Hospital, 275 Beds, general rotating service of 1 year ward and private in all branches of medicine and surgery, including the specialties and contagious pavilion. Metropolitan area of New Jersey, 15 miles from New York City, grade A applicants from grade A schools ; frequent clinical conferences ; weekly seminar ; excellent medical and surgical library ; salary $100 per month, with full maintenance.

Apply to Chairman, Intern Committee, St. Elizabeth Hospital, Elizabeth, New Jersey.

Public Appointments

YORKSHIRE. WEST RIDING COUNTY COUNCIL. CHILD-GUIDANCE SERVICE. Applications are invited from suitably qualified Men and Women with psychiatric experience for the post of CHILD-GUIDANCE PSYCHOLOGIST. Salary for Men £800–£25–£1000 and for Women £720–£20–£800.

Forms of application, particulars of duties and conditions of appointment may be obtained from the Chief Education Officer, County Hall, Wakefield, to whom completed application forms must be returned not later than 14 days after the appearance of this advertisement.

BIRMINGHAM. CITY OF BIRMINGHAM. Applications are invited for the appointment of ASSISTANT MEDICAL OFFICER (Male or Female) in the Maternity and Child Welfare Department. The duties will include work in connection with children of all ages in the care of the Children's Committee, in addition to normal maternity and child-welfare work. Applicants should have had experience in work with mothers and children, including a 6 months' resident post in a maternity hospital and in a children's hospital. The D.P.H. or D.C.H. will be considered an additional qualification. The salary scale is £735 p.a., rising by annual increments of £25 to a maximum of £935 p.a. ; the commencing salary within that scale depending on the Medical Officer's experience. In the event of any amendment of agreed national scale the new rate will apply. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, to the candidate passing a medical examination, and to 1 month's notice on either side.

Applications, endorsed " Assistant Medical Officer for Maternity and Child Welfare," giving full details of training and experience, together with copies of 3 recent testimonials, should be submitted on a form obtainable from the Medical Officer of Health, Council House, Birmingham, 3, and returned to him on or before the 15th January, 1951.

COLONIAL MEDICAL SERVICE. In the larger Colonies MEDICAL OFFICERS are required for general duties, including hospital and district work. These appointments offer great scope for the practice of many branches of medicine and surgery with a considerable measure of independence and personal responsibility. Appointments can be made on a permanent basis with pension (non-contributory) at age of 50 or 55, or on a temporary basis with gratuity. Secondment from the National Health Service can usually be arranged for periods up to 6 years with continuation of superannuation contributions and the payment of a resettlement grant on reversion to the National Health Service. Salaries range from £860 to £1630 a year, the starting salary depending upon age and experience. In most territories in Africa the scale for newly appointed doctors with an approved higher qualification is £1050–£1600 a year, with a higher point of entry according to experience. There are many specialist and administrative posts with salaries above this scale available for officers in the Service on promotion. Free passages are granted in both directions. Income-tax is very low. Tours of service vary from 10 months in Nigeria to 4 years in Kenya. Houses with heavy furniture are provided in most territories at a rent of about 10% of salary. Annual local leave is available and generous home leave is granted after each tour. Study leave on full pay is available for those who wish to acquire higher qualifications. Social and recreational amenities are good. Officers serving in East and Central Africa usually prefer to educate their children within that area, where schooling is available, or in South Africa. The short tours in West Africa enable frequent visits to be made to children being educated at home. Many officers have their children with them in West Africa until they reach school age.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1. (Ref. No. 27215/14.)

NORWICH. CITY OF NORWICH. Applications are invited from registered medical practitioners for whole-time appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER. Salary £735 p.a., rising by annual increments of £25 to £935 p.a., the commencing salary to be paid having regard to experience and qualifications.

Particulars can be obtained from the undersigned, and applications should be received by him not later than 18th January, 1951.

V. F. SOOTHILL,
Medical Officer of Health and Senior Medical Officer.
68, St. Giles'-street, Norwich.

OVERSEAS FOOD CORPORATION invites applications for the post of SURGICAL SPECIALIST. Applicants should hold a higher surgical qualification and be of the status of Senior Hospital Medical Officer or Senior Registrar. The appointment is in a combined European and African hospital of 150–200 Beds. Commencing salary, according to qualifications and experience, between £1300 and £1600 p.a., rising to £2000. Income-tax at East African rates. Free return passage for employee and for family once in each tour of 3 years. 6 months' home leave on full pay after each tour. 14 days' local leave annually. Pension scheme.

Applications should be made before the 24th January, 1951, to Chief Health Officer, Overseas Food Corporation, 29–33, Hill-street, London, W.1.

ROYAL AUSTRALIAN NAVY

Applications are invited from legally qualified medical practitioners for appointment as MEDICAL OFFICERS in the Royal Australian Navy. Previous commissioned service on full pay in British Forces may be taken into consideration in determining pay and seniority on appointment. Minimum yearly emoluments on appointment for single officer £1085 and for married officer £1244. Increment of £54 15s. payable after 2 years' service. Gratuity of £500 payable after completion of 4 years' service, or pro-rata on approved discharge after completion of 2 years' service. Emoluments payable in sterling currency until departure from U.K. First appointment is for short term service with prospect, if desired, of appointment to Permanent List.

Full details may be obtained from R.A.N. Liaison Officer, Canberra House, 85, Jermyn-street, London, S.W.1, and Secretary, Department of Navy, Melbourne, S.C.1.

LANCASHIRE COUNTY COUNCIL. Applications invited from registered medical practitioners for appointments of 7 ASSISTANT DIVISIONAL MEDICAL OFFICERS. Possession of D.P.H. desirable. Salary £860–£50–£1060 p.a. Travelling and subsistence allowances where applicable. Posts superannuable and subject to medical examination.

Application forms with full particulars obtainable from County Medical Officer of Health, County Offices, Preston.

LEICESTER. CITY OF LEICESTER HEALTH DEPARTMENT. Applications are invited for the post of SENIOR ASSISTANT MEDICAL OFFICER for Maternity and Child Welfare, from registered Women medical practitioners holding recognised qualifications in public health or state medicine. The appointment is that of Deputy to the Medical Officer for Maternity and Child Welfare, who is Supervisor of Midwives, but the duties, in addition to work in connection with the Maternity and Child Welfare Service, will also include those of Assistant School Medical Officer. The Officer appointed will work under the control of the Medical Officer of Health and will be expected to carry out the above duties and such other duties as are assigned to her. Salary £950–£25–£1150 p.a. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, is terminable by 3 months' notice on either side, and the successful candidate will be required to pass a medical examination.

Further details of the appointment may be obtained by reference to the undersigned, and applications, together with copies of 3 testimonials, should be received by 10th January, 1951. E. K. MACDONALD, Medical Officer of Health.

City Health Department, Grey Friars, Leicester.

MANCHESTER. CITY OF MANCHESTER. Applications are invited from registered medical practitioners for appointment as ASSISTANT MEDICAL OFFICER in the Maternity and Child-welfare Section of the Health Department. Applicants should have obstetric or/and pædiatric experience and will be required to undertake duties in clinics. Possession of the D.P.H., D.C.H., or D.Obst.R.C.O.G. qualifications will be essential. The salary scale is £735–£935 p.a., plus a temporary bonus of £65 p.a.

A form of application can be obtained on request, and must be sent, with copies of 3 recent testimonials, in an envelope marked "Assistant Medical Officer, Maternity and Child Welfare," to me only, and not to any member of the Council, not later than 13th January, 1951. Canvassing is prohibited.

PHILIP B. DINGLE, Town Clerk.

Town Hall, Manchester, 2.

WORCESTERSHIRE COUNTY COUNCIL. Applications are invited for the appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH in the Borough of Oldbury at a salary in accordance with the revised Askwith scales, the commencing salary (including cost-of-living bonus) being fixed within the range £735 rising by £25 to £935 p.a. The appointment will be subject to the Local Government Superannuation Act, 1937. The successful candidate will be required to pass a medical examination and to reside in or near the Borough of Oldbury. Applicants must be registered medical practitioners, and the possession of a D.P.H. would be an advantage; it is desirable that they should have had previous experience of the school health and the maternity and child-welfare services. Travelling expenses will be paid in accordance with the County Council's scale.

Forms of application can be obtained from the County Medical Officer of Health, County Buildings, Worcester, to whom completed applications should be sent within 14 days of this advertisement.

W. R. SCURFIELD, Clerk of the County Council.

Shirehall, Worcester.

YORKSHIRE. NORTH RIDING OF YORKSHIRE. Applications are invited from suitably qualified medical practitioners for the whole-time joint appointment of MEDICAL OFFICER OF HEALTH to the Flaxton and Easingwold Rural District Councils and ASSISTANT COUNTY MEDICAL OFFICER. The successful applicant may later be required to undertake the duties of Medical Officer of Health for the Thirsk and Wath Rural Districts without additional remuneration. Salary £1100 p.a., rising by £50 p.a. to £1300 p.a. A travelling allowance on the County Council's scale will be paid for a car not exceeding 10 h.p. Medical examination necessary as post superannuable; private practice not permitted; office accommodation available. The appointment will be determinable by the officer by 3 months' notice in writing and by the Councils concerned with the consent of the Minister of Health at pleasure. The Health Committee of the County Council have under consideration the erection of a house at Easingwold for renting to the officer appointed.

Forms of application, &c., may be obtained from the undersigned. Canvassing, in any form, prohibited. Last day for receipt of applications 9th January, 1951.

H. G. THORNLEY, Clerk of the County Council.

County Hall, Northallerton, December, 1950.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited from fully qualified and registered Male medical practitioners for the post of ASSISTANT SCHOOL MEDICAL OFFICER (whole-time). Salary scale £735–£935 p.a. A car allowance is made. The duties will consist of routine medical inspections in schools and clinic work. Experience in refraction work is desirable.

The appointment is subject to the provisions of the National Health Service superannuation regulations and is terminable by 1 month's notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application, which may be obtained from the undersigned, should be completed and returned as soon as possible.

J. F. CARR, Director of Education.

Town Hall, Hanley, Stoke-on-Trent.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT PUBLIC HEALTH DEPARTMENT. Applications are invited from qualified medical practitioners (Women) for the post of ASSISTANT MEDICAL OFFICER in the Maternity and Child Welfare Services. Candidates should have experience in diseases of children and obstetrics. Opportunity will be given for hospital contact with both pædiatrics and obstetrics. The possession of a D.P.H. or D.C.H. will be an advantage. Salary will be at rate of £835 p.a., rising by annual increments of £25 to £935. Appointment will be subject to the provisions of the National Health Service (Superannuation) Regulations, 1950, and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Medical Officer of Health, Public Health Department, Glebe-street, Stoke-on-Trent, to whom completed forms should be returned accompanied by copies of not more than 3 recent testimonials, not later than 20th January, 1951.

HARRY TAYLOR, Town Clerk.

General Practice

For an Executive Council post apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

WEST LINTON, PEEBLESSHIRE. Applications are invited from registered medical practitioners willing to provide General Medical Services under the National Health Service Act for a VACANCY caused by the death of the only resident practitioner in West Linton. The practice, which covers West Linton and the surrounding districts, is classified as rural and the number of patients on the list of the deceased practitioner is 1871. It is understood that the practitioner's house will be for sale. Applications, stating age, qualifications, and experience, should be sent within 14 days from this date to the Clerk, Lothians and Peebles Executive Council, 25, Stafford-street, Edinburgh, 3.

Appointments: Too Late for Classification

APPLEY BRIDGE, near WIGAN. WRIGHTINGTON HOSPITAL. Applications are invited for the posts of HOUSE SURGEON and HOUSE PHYSICIAN to commence duty early in February. Terms and conditions of service as per national scale. The Hospital has 299 Beds (adults and children) for treatment of orthopædic tuberculosis and 52 Beds (adult) for the surgical treatment of pulmonary tuberculosis. Resident Surgeon-Superintendent, 3 Assistants, and Visiting Consultant Surgeons and Physicians. R practitioners may apply.

Applications to Surgeon-Superintendent, giving qualifications and names of 2 referees.

WORKSOP, NOTTS. KILTON HOSPITAL. Required, OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON, vacant 1st January, 1951. National scale of salary.

Applications, stating age, qualifications, and experience, with 2 names for reference, should be forwarded to the Secretary, Worksop and Retford Hospital Management Committee, Victoria Hospital, Worksop.

Hospital Services: Non-Medical Appointments

CHELMSFORD (ESSEX) SCHOOL OF NURSING GROUP TRAINING. (900 Beds.) Hospitals participating:—

Chelmsford and Essex Hospital, Chelmsford.

St. John's Hospital, Chelmsford.

Broomfield Hospital, Broomfield, Chelmsford.

Period of training 3 years (including preliminary training school).

Applications are invited from well-educated girls of 18–30 years. Forms and particulars may be obtained from the Matrons of any of the 3 hospitals.

Miscellaneous

Ethical Pharmaceutical Manufacturers invite applicati from medical Men, under 30, as Assistant for compiling technica literature in Medical Department of Manufacturing Laborator in London. Commencing salary £700.—Address, No. 495, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Professional Consulting-rooms, Harley-street, Lease for Sale, beautifully appointed.—Write: Address, No. 494, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method." 24-hour service.—Send specimen of urine and £1 1s. fee to: M.O. LABORATORIES LTD., 24, Welbeck-way, London, W.1.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141) who are specialists in this kind of work.

Microscopes. Second-hand Bargains, guaranteed sound order. Write for List. Deferred terms if required.—WALLACE HEATON LTD., 127, New Bond-street, W.1 (MAYfair 6511).

Watson Service Microscope for Sale. Fine condition and with 1/12 oil-immersion. £35.—FRObisher 4684.

Executors of late Practitioner have for Disposal Medical Books and Surgical Instruments. Any reasonable figure accepted. Good opportunity for student or practitioner commencing.—Apply, Executors, c/o Address, No. 493, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Rolls Royce 25 h.p. 1934, Thrupp & Maberly 7-seater Limousine, 1 owner, chauffeur driven. Rolls serviced. Unused since 1939. Mileage 66,000. Immaculate condition. £1250.—BOOTHMAN, 47, Grosvenor-square, London.

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'Pendex' presents, in a stable aqueous solution, the potent antibacterial action of penicillin combined with the rapid and prolonged vasoconstriction of 'Paredrinex'. The superior penetrative action of penicillin, aided by a vasoconstrictor, makes 'Pendex' a valuable local treatment in established nasal infections where the organisms are often too deeply embedded to be exposed to the killing effects of surface acting drugs.

When prepared as directed 'Pendex' will contain, for one week at room temperature, not less than: Crystalline potassium penicillin G, 1,500 International Units per ml.; 'Paredrinex', 1 per cent.; in a specially buffered aqueous solution.

The 'Pendex' package consists of penicillin in dry state and a buffered aqueous solution of 'Paredrinex'—each in a separate container. The pharmacist has only to mix the two, and 'Pendex' is dispensed freshly prepared and with the penicillin at full therapeutic potency.

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